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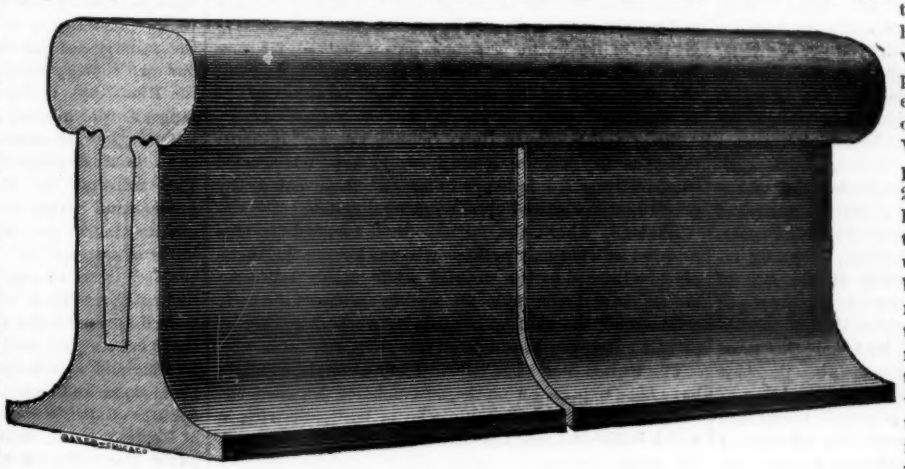
COMBINATION CONTINUOUS RAIL.

The Superintendent of the Darlington Cannel Coal Railroad, in Pennsylvania, has lately entered the lists with the many inventors who are trying to secure an economical continuous rail. The result of his experiments is shown in the accompanying engraving.

The rail is made in two parts, the upper part fitting within the lower so that, when they are "telescoped" together lengthwise, the parts are held firmly without the use of bolts or any other method of fastening. It will be seen from the notched form of the top of the base of the rail that the weight of the trains and concussion of the wheels tend to tighten the joint and combine the rail more firmly.

If the rail will work satisfactorily in other respects its economy is obvious, as the top may be made of steel and the base of iron, saving largely in first cost as well as in renewals. An objection which would probably at once suggest itself to a railroad man, is the difficulty of rolling the parts. The patentee has a plan for overcoming this which we will present in a future number. Mr. P. L. Grim, New Galilee, Pa., or David Grim at Pittsburgh, will be glad to answer all inquiries addressed to them on this subject.



Grim's Patent Continuous Rail.

De-Railment of Railway Trains.

All engineers who have had experience in railway management are familiar with cases in which accidents have arisen from engines or carriages leaving the line without, apparently, any sufficient reason. No doubt in the vas tmajority of instances, when a train leaves the line, there is evidence to prove why the de-railment took place; but this is not always the case—and in many an instance the subsequent investigations which have been made have failed to show the causes which led to the accident. Now, an accident which is accounted for is bad enough; but an accident which is unaccounted for is far worse, for in the latter case no experience is gained which may lead to the avoidance of a disaster in future. For this reason we consider that whenever a mishap of the kind of which we are speaking occurs no trouble should be spare in determining, if possible, its real cause, and if this cause is one which is not generally known, information concerning it should be disseminated amongst those whom it interests. It has been often stated that a record of engineering failures would be more instructive than an account of engineering successes, and to no class of failures does this remark apply more truly than to railway accidents.

We have said that there have been many instances in which trains have left the line without, apparently, any sufficient reason, and it is of this class of railway accidents that we wish to speak here. And, first, as to the ordinary causes of de-railment. These are: Weak or uneven permanent way, bad joints, wheels with flanges worn to a sharp edge on the outer side, and curves worked by engines or vehicles unfitted to pass round them. Where any one of these causes exists there is no difficulty in accounting for a case of de-railment; but when none of these are present—when the permanent way and wheels are in good order, the speed of the train not excessive, and when the accident does not occur on a curve—we have to search further for the causes which give rise to the mishap. When a train is running at a fair speed on an ordinary line of railway, the rails receive a succession of lateral blows from the wheel flanges, these blows—which are more or less severe according to the state of the road and construction of the rolling stock—being nothing but a series of endeavors on the part of the train to "run off." Now, supposing the tyres and permanent way to be in good order, and the line to influence of lateral pressure is prevented by the weight be straight, "running off" can only occur when the force with which any wheel flange strikes the rail literally is sufficient to cause that flange to act as a kind of inclined plane, lifting the weight resting on that wheel and thus causing "mounting." It may at first sight appear that, considering the forms of tyre and rail section in ordinary use, no amount of lateral force which is likely to be available would suffice to cause the lifting of the weight upon the wheel in the manner we have just mentioned; but a little further investigation of the case will show that the possibility of such an action certainly exists. Let iron templates of ordinary tyre and rail sections be taken and placed together in the manner in which a wheel bears upon a rail, and let a pressure be then applied to the inner edge of the tyre template, when it will be seen that the latter can be readily made to rise from its bearing upon the rail. In the case of an ordinary engine or carriage, this mounting under the insistent upon the wheel, and we thus see that in the steady maintenance of this weight lies one of the principal safeguards against de-railment.

This brings us to the question as to how much the insistent weight upon the wheels of an engine or carriage varies when running at moderately high speeds; and this is a question to which no precise answer can be given. That the load on the wheels does vary—and vary considerable too—is clearly shown by the play of the spring; but the degree of the maximum variation depends so greatly upon the construction of the rolling stock, the manner in which it is loaded, and the state of the permanent way, that not even a general statement of its amount can be given. That, however, this variation is in many cases very far greater than is usually supposed, is proved by some interesting experiments on the subject which have been made by M. de Weber, of the States Railway of Saxony. These experiments, which have been made, by the aid of suitable arrangements, on six-wheeled engines having, we believe, all the axles under the barrel of the boiler, show very startling results. They show that in the case of trailing wheels carrying a normal load of 5¾ tons each, the load when running varied from 10 tons to 1½ tons: while in the case of leading wheels having each a normal load of 3½ tons, the load when running varied from 8 tons down to zero! Now, although we should hope that such an occurrence as the total removal of the load from one of the leading wheels of the engine is an exceptional one, yet the fact that it occurred during M. de Weber's experiments prove that it is likely to occur again under certain conditions; and it is certainly more than probable that if this removal of the load took place simulttaneously with a severe lateral blow of tho flange of the wheel against the rail "running off" would be the result. M. de Webers's experiments, in fact, go to show that most of the "mysterirous" de-railments which have occurred have probably been done to this simultaneous occurrence of a severe lateral pressure, and and an upward oscillation of the load on the springs of the particular wheel which has mounted, this action being in many instances further assistsd by one of which we shall now proceed to speak.

In addition to his experiments on the variation of load on wheels of engines when running, M. de Weber has made a number of others on the lateral stability of permanent way, and although these experiments were carried out on the somewhat light rails of the State Railway of Saxony, the results obtained possess considerable general interest. When a line of rails is subjected to a lateral pressure, applied to to the side of the head of the rail at any one point, it may yield by the flexure of the rail itself, by the turning of the rail on its base, or by the direct movement of the sleepers on the ballast; and as far as the two last-mentioned causes are concerned, it will be found that the amount of yielding, which will take place, will be greatly modified according to the load which the rail is carrying at the time when the lateral pressure is applied. Thus M. de Weber found that the resistance of the sleepers to lateral movements on the ballast was increased tenfold, as compared with the same line unloaded, by the imposition of a load of 28 tons; while in the case of Vignoles rails, on which the experiments were tried, a force of 2¾ tons, which produced an enlargement of the gauge to the extent of 1⅝ in. when the line was unloaded, produced a spreading of but one-sixth in. only when the rails were carrying a load of 11 tons on a pair of wheels. These results show that the relieving of the wheels of weight by the vertical oscillations not only facilitates mounting, but also diminishes the lateral resistances of the rails to a spreading of the gauge, and it thus tends to produce de-railment in two ways. M. de Weber's experiments thus go very far to explain the causes of "running off" which are not accounted for by ordinary causes, and we should be glad to see them followed up by similar experiments on the engines and forms of permanent ways in general use in this country.—*Engineering.*

The Early Days of American Railroads.

We had the pleasure a few days ago of meeting Mr. William Simpson, of Easton, Pa., who may reasonably claim to be one of the oldest railroad men in America. The first rail ever laid on wooden sleepers was laid by him on a turn-out of the Camden & Amboy Railroad about half-way between New York and Philadelphia in 1832. Up to that time the rails had been laid upon stone blocks and it was thought necessary to make the track perfectly solid and inelastic. Locust planks were placed upon the stone blocks and made as smooth as possible. While laying the track of this road Robert Stephenson examined the work. In some places he found that he could put a knife blade between the rail and the plank. He condemned this as a serious defect and thought that the plank should be planed smooth. He said that they would want to use locomotives sometime, and if there should be any "give" to the rails the engines would be thrown off the track.

Mr. Simpson helped to land a locomotive in the spring of 1832 at Newcastle, Del., to be used on the Newcastle & Frenchtown Railroad, when there were only three or four in America.

THE House Railroad Committee has agreed to report a bill authorizing the Central Branch to continue its road to connection with the Union Pacific at a point not west of the hundredth meridian. No subsidy in bonds is to be paid, and the land grant is fixed at twenty sections to the mile, and such lands as are already taken up by the St. Joseph & Denver road are to remain vested in the latter. Authority is given to issue its own mortgage bonds on extension to the amount of $30,000 per mile.

Contributions.

ENGINEERING.

The Introduction of Railways—Location and Plans—Grades and Curves—Excavations and Embankments.

BY BENJ. H. LATROBE, C. E.

SECOND LECTURE—FIRST SECTION.

In the lecture of which this is the sequel, I began by presenting a general view of the subject of Engineering as exhibited in the various works with which it has to do, whether they belong to civilized society in a state of war or of peace. I say *civilized* because purely savage nations have nothing to do with Engineering, their works of defense being trees or rocks, their engines of attack bows, arrows and tomahawks, and their navies fleets of canoes; while, when not upon the war-path, their journeys on foot, or at best on horseback, from one hunting-ground to another, are trodden through the trackless forest or over the boundless prairie, or paddled in their vessels of bark or hollowed trees, upon the swift current of a river or the placid waters of a lake. The remains of rude fortifications upon the summits of hills, and of burial mounds upon the surface of plains, which are found beyond our Allegheny range, were the works of a people possessed of some of the simpler arts of life, yet they cannot be called works of engineering. Considering their mode of traveling, however, without vehicles of any description, or freight of any kind to load them with, the Indians of this continent and the aborigines of other parts of the earth were really better off for roads than were the European nations up to the middle of the last century, as I think was clearly shown in what I had occasion to quote upon that subject in my previous lecture. I therein treated fully of the state of the highways which, but for the aids to inter-communication afforded by the sea and its rivers, and the canals which they fed, would have kept the civilized and refined society of England and the Continent in a state of almost complete isolation. The wealth, however, which agriculture and manufactures produced, afforded the means of establishing, early in the present century, a system of turnpike roads in England which rivalled that of France, and over which the new-modelled coaches, drawn by relays of the finest horses, rolled smoothly at the rate of ten miles an hour. There were two principal modes of constructing these roads, that of Telford the most substantial and expensive, and that of McAdam the most rapidly executed and the cheapest, and also the best known to us in America, and used in the building of most of the turnpikes between our principal towns and cities. I may mention, also, plank roads, as affording a pleasant though perishable species of way, and one advantageously employed in flat, swampy parts of the country, where timber abounds and stone is not to be had; and that gravel, properly applied, also makes an excellent surface for travel we have an instance in the beautiful avenue which forms the extension of the street on which stands the building in which you are now sitting. These roads, however, vast as was their improvement upon their predecessors, were now to give place as highways of travel to the *Railway*, to which I proceed to devote the present, as announced in the preceding discourse.

That the office of the railway is to combine within itself, as far as possible, the best qualities of all other modes of travel and transportation is evident to all who hear me, and that it has in a great measure accomplished that object is equally manifest. Not, either, that the railway, even in its present highly advanced form, has attained absolute perfection in its own structure and operation, or that it has superseded or is destined to supplant all other means of conveyance. The canal will continue, in districts where it is advantageously located, to bear the heavy burthens of slow and cheap transportation; the macadam, or gravel, or plank road will bring to the canal and the railway the freight and the passengers destined to be borne by them to distant points, and the navigable river, with its fleet and superb steamers, will carry on a lively competition with the railway on its banks; but the railway, from its ability to penetrate all parts of the habitable globe, where there is not water enough to feed a canal, yet enough to supply a locomotive, from its defiance of the drouths of summer and the snows and ice of winter, its power and its speed, and the luxurious comfort it can afford the traveler, and the expedition and economy with which it can convey his goods, must for all time be the grand highway of the world.

The practical familiarity of my auditors with this wonderful yet well known medium of social intercourse far and near, would seem to leave me little to say about it for their information or entertainment. It is, however, one thing to recline at ease in the velvet cushioned seat of a "palace car," forgetting, in the pleasure of conversation or reading, with an occasional glance at the rapidly vanishing landscape, that you are not in your own drawing-room at home, and quite another thing to acquire an acquaintance with the character of the work which enables you to enjoy this luxurious mode of speeding from place to place. My object will therefore be to show how these marvellous results have been reached, or, in other words, how railways are planned, laid out, constructed and operated, so as to bring about those amazing changes in the business and social relations of mankind.

First, then, how are railways *planned?*

In its broadest sense, this work of *planning* may be done in the first place either upon a general system, embracing the whole territory of a nation, and framed with regard to the present and prospective wants of its population, in advance of any actual construction, in which case it is the province of the Government to perform the duty; or it may be left to grow up gradually out of the wants and the enterprise, and the commercial rivalry of the cities and towns and their intermediate districts.

In Belgium the railways were planned and constructed wholly by the Government, upon a system so judicious that it rapidly developed all the resources of that small but highly intelligent and industrious State.

In France the Government, after waiting to see how the railway succeeded in England, entered, but with apparent hesitation, upon a concerted scheme of railway inter-communication, intended to be carried into effect by chartered companies, but which had ultimately to be executed chiefly by State aid.

In Germany, Sardinia and Switzerland, a mixed system of plan and construction has prevailed, both Government and people participating in it, while in the great military Empire of Russia the supreme power has so far projected and built the lines deemed necessary to facilitate the movement of its armies as well as those of its commerce.

Spain and Southern Italy, behind the age in most things as they have been until lately, have constructed comparatively few railways so far, and those chiefly by private enterprise and upon no general system.

England, where the railway first assumed its true position as what may perhaps without forcing the metaphor be likened to the *arterial* while canals represent the *venous* and telegraphs the *nervous* system of the body commercial, has built up her iron network altogether by private enterprise consolidated into corporate form.

The United States has followed her example, as might have been expected from the resemblance between the free institutions and characteristics of both countries, in which individual and associated effort is allowed such full scope.

As my object, however, in the remainder of what I have to say, is to deal with the *physical* rather than the *political* features of the railway, I will proceed to show how the civil engineer performes his task of designing and constructing a railway, assuming that the Government has done its part in granting the charter, and the President and Directors appointed thereunder to provide the capital and attend to the general management of the enterprise have furnished the means of carrying it into effect.

To *plan* a railway then, in this sense, the points it is intended to connect being determined, is first to *locate* it. The intermediate country being accurately surveyed in advance by the eye of the engineer in reconnoisance and afterwards by those nice instruments which modern skill has provided,and the results placed upon paper, he is prepared to address himself to the question of the best route. Were the region a perfect plain with no obstruction in the way and no attractive influence on other side to cause a deviation from the direct line, this would, I need scarcely say, be his instantaneous device. Such a case is, however, of exceedingly rare occurrence. I might say, indeed, that it is *almost* (though not wholly) without precedent, even upon the well nigh boundless stretch of our western prairies. If no physical obstacle intervened, a commercial one is almost sure to arise, and some town or village or neighborhood to be favored by facilities afforded by the road draws it one side. At the dawn of the railroad day crude indeed were the ideas which prevailed in the early twilight of that period, and it will amuse you to be told that the theory was gravely put forth that the line should be made as *long* as possible, that there might be more miles to take toll upon. This was, however, in the first flush of the fever which seized our own community when our two lines to the West and North were projected, and a scramble for their stocks took place in marked contrast with the indisposition since after manifested for similar investments.

The engineer, then, having completed his surveys, embracing the various routes which the topography of the country may present or which may, in the face of its natural features, be suggested and urged by interested partes, proceeds to make his estimates and report, and, the location of the line being established, whether in accordance with or in opposition to his recommendation, the construction of it is commenced; and my business will now be to exhibit to you the several particulars which go to make up the general idea of the railway, and the machinery by which it is operated. In doing this I shall necessarily have to draw upon all those that have ever been built, as upon no one of them is to be found every form of structure which I shall have occasion to notice.

But first I must make some remarks upon those important features of every railway which determine its character and capacity for the rapid and economical transportation of passengers and tonnage; *namely*, its *gradients* and *curvatures*.

Without going, in a popular discourse like the present, into an explanation of the scientific principles involved in this part of my subject, it will be sufficient to say, what indeed is understood by you all, that any departures from a line perfectly level and straight must increase the resistance to locomotion and demand increased power to overcome them. As a hill or a sudden turn on an ordinary road will make your horse slacken his pace, so will an ascent or an abrupt bend upon a railway bring down the speed of an engine, or, if the speed is kept up, some part of its train must be cast off. Hence it is the aim of the engineer to reduce the grades and curves of his line to as near an approach to the level plane and the right line as the country will permit. There are, indeed, other considerations which come in to modify the application of this rule, as where the usual weight of the trains in the two opposite directions is unequal it is better that the lines should descend in that of the preponderating trade. This is the case in most of the railways of the World, and especially in those of our own country which connect the Atlantic coast with the Mississippi valley across the Allegheny Mountain range, as the mineral and agricultural products of the latter region far outweigh in tonnage the merchandise and other freights for which they are exchanged. The railways of Europe generally exhiblt easier grades and curves than those of the United States, not so much on account of a more even surface in the country as that their more abundant capital has enabled them to expend more in forming the beds of their roads, with a view to economy in motive power as well as wear and tear of track; for steep grades and sharp curves are unfavorable in both those particulars. In England especially money has not been spared to avoid them, and many of the boldest and most striking features of their railway lines are due to their manner of locating them. Still, it is only those routes which pursue the valleys of streams or cross level plains which do not show undulatory profiles, alternately ascending and descending at various degrees of inclination. It must be admitted that the descents in a degree compensate for the ascents, and, early in the railway era an earnest controversy was carried on between a Mr. Badnall and some of his professional brethren as to the soundness of certain theories propounded by him upon the subject, which, if they had prevailed, would have led to the construction of railways upon a series of *artificial* inclines, even upon ground naturally level. Whatever may have been the abstract merit of his views, their application in the manner proposed would have been practicable in so few cases that they had no influence upon the location of railways, unless, perhaps, where the conformation of the country favored if it did not compel their adoption. It has not generally been practicable to arrange a system of grades to suit exactly the character of the trade to be carried. This is particularly desirable upon railways bearing coal and other heavy products of small intrinsic value compared with their weight, yet there are but one or two cases within my knowledge in which it has been accomplished. The Philadelphia & Reading Railroad, opened some thirty years ago, is the most complete example of the kind, It descends the valley of the Schuylkill river from the anthracite coal mines of Pennsylvania to the city of Philadelphia, without encountering a single ascent. Much of it is precisely level, which to favor the coal trade still more, had better have been inclined; yet the powerful engines employed in that trade draw trains of surprising length loaded with 500 tons of that fuel. The railways in the Lehigh valley possess the same advantages of grade, but not that of terminating immediately in a great city. Our Baltimore & Ohio Railroad has a favorable although not a constantly descending grade in the valley of the Potomac, and, although it has a ridge to surmount between that valley and the tide in our harbor, it brings us the coal of the Cumberland mines at a cheap rate. The coal of the Susquehanna valley which does not reach us by canal passes over the same ridge upon the Northern Central Railroad. On the whole we are as well off in this regard

as New York, much of whose railway-borne coal has to encounter summits much higher than those just mentioned. Enough has been said for the present upon the subject of grades, to which I shall refer again in speaking of locomotive engines.

In regard to the curves of a railway, it may be briefly said that, although at first they might have seemed, by comparison with the free turning of common carriages on ordinary roads, to present an insuperable obstacle to the movement of wheels closely confined between two unyielding lines of iron, it was soon found that, by the observance of proper conditions, they were traversed with ease and safety, although with a necessary increase of resistance, especially at high velocities. Sharp curves, indeed, are not desirable, either for the economy of transit or the comfort of the traveller, the equilibrium of whose feelings is apt to be disturbed by that inward inclination which is required to preserve that of the car in which he is sitting, and which sometimes reminds him of the wonder with which, in his boyish days, he looked upon the equestrian performances of the circus. No railway, however, can be carried along the serpentine ravines of a broken country, or the precipitous sides of a lofty mountain, without a great deal of curvature, and all the routes which cross the great dividing ranges of America or Europe, exhibit remarkable examples of horse-shoe bends, where the track doubles upon itself and trains following, each appears to be pursuing opposite directions.

I pass now to the works embraced in railway *construction*, and which consist of *excavations and embankments, tunnels, bridges, tracks, water-tanks, engine-houses, machine shops, station buildings and telegraph lines.* These form the *fixed* part of the railway institution. The *moveable* division consists of *locomotive engines, freight cars and passenger cars*, under the general name of *rolling stock*, or, as the English quaintly and rather contradictorily call it, "plant," on the principle, we suppose, of "lucus a non lucendo," as even the "sensitive plant" and the "fly-trap flower"—the liveliest of the vegetable kingdom —are not gifted with locomotion. In order to give to what I have to say under these heads, as much of an *historical* tone as possible, as that is always the most interesting shape in which any subject can be presented in an address like this, I will speak of them in their advance from their earliest to their latest and most improved form.

Excavations and embankments are things simple enough in themselves, yet I shall have some remarks to make about them, as their execution is sometimes attended with no little difficulty. They are always mentioned in connection with each other because the material excavated from one part of the road-bed is used, by hauling it in carts or in cars running upon a temporary track, to make the embankment upon an adjacent part of the same; yet not invariably, as where there is an excess of excavation, it is deposited outside of the limits of the road, in what are technically called "spoil banks," not in the sense of something valuable captured in war or the reward of the victors in *politics*, but rather, I presume, because they spoil the looks of the work, being unsightly excresences upon it. On the other hand, where there is a deficiency of material in the cuttings to supply the embankments, an equally unsightly thing is seen near by, called a *borrow-pit*, because earth is borrowed therefrom, or rather brought from the usually exacting land owner to make up the deficiency. It is the object of the engineeer to make excavation and embankment balance each other as near as possible, as the economy of the work, as well as the neatness of its appearance, is best attained thereby. But this can seldom be accomplished, on account of the usual irregularity of the ground and the necessity of consulting other considerations, as to grade, curvature, etc. Excavations, according to the material in which they are made, whether of earth or rock, have their sides more or less steep, the object being always to give them an angle at which they will stand without slipping. As earth is of every variety and consistency, it is necessary to give it a slope suited to its particular nature, whether that be clay, or sand, or gravel, or a mixture of each, and whether it be dry or wet. Water is the great softener and lubricator of earth, and wherever it is found in earth excavation, slides will occur. The traveler hence to Washington or the West, will see see within three or four miles of this city, in what is known as the "Deep Cut," a striking example of this fact. The ochrous earth of every shade of color is worn into deep gullies, upon the sides which rise one hundred feet and more above him. He will also notice, if he looks observingly out of his window, the decayed remains of the heads of sound timbers projecting above the surface near the bottom of the slope. These piles were driven long years ago, and not long after the road was opened, with a view to arrest the sliding of the earth, the weight of which as it descended, pressed up the bed of the road, a case of not uncommon occurrence in deep excavations of this description, and one which has sometimes put the resources of engineering to severe tests. The piles were not effective in this particular case, although they have been in some others, resorted to successfully when applied in a different way. The mischief, however, generally mends itself in the course of time; the slope gradually flattening by the sliding of the material, the weight which caused it is lessened little by little, until an equilibrium is restored, and the trouble is at an end.

The same sort of movements which take place in *excavations* occur also, although in a reverse manner, in *embankments*, when formed of similar material; and you sometimes see the slopes of the latter swelling out irregularly towards their bases, and even carrying with them the natural soil upon which they rest. The forces exerted by these slowly moving masses are so enormous that usually no artificial work is sufficient to resist them. The most effectual preventive is a system of drains, by which the water which has occasioned the movement, is diverted.

Excavations in *rock*, it might naturally be supposed, would never give any trouble of this description, and if the rock were in a solid body it would be so; but rock is usually composed of a variety of strata of different degrees of hardness and ability to withstand atmospheric action upon the surface. If an excavation consisted of rock of uniform quality, it would simply crumble if soft and easily affected by atmospheric changes; but if it be alternately hard and soft, the soft layers yield gradually, leaving the harder ones projecting more and more until, their support failing, they break off and fall. It is not unfrequently necessary in such cases to replace the waste of the softer ledges by masonry, especially if they occur near the bottom of the excavation. Instances of actual occurrence upon many lines of railway will no doubt occur to you.

The construction of a permanent road bed over *boggy* ground is often an interesting problem for the engineer. One of the most remarkable examples of this was in carrying the frmous Liverpool & Manchester Railway over the morass of Chat Moss. It being found that the heavy earth out of which it was at first attempted to build the embankment sunk out of sight as fast as it was thrown in, a different method had to be adopted. This consisted in digging trenches along and crosswise to the road, and throwing up the spongy material, which soon dried in in the air. Large bundles of hurdles or facines being placed upon it transversely and covered with gravel, a firm although elastic support was attained for the track. At some points the surface of the moss, which is a vast mass of vegetable growth and is higher than the adjacent ground, had to be cut into to a depth of eight or nine feet in reducing it to the grade of the road. This was also accomplished by a similar system of previous drainage, which allowed the water to flow off to a lower level.

Upon the railways crossing our western prairies deep swampy spots have been successfully crossed by various expedients, the principle upon which they all, like that of Chat Moss, depend, begin to provide a wide surface of bearing upon the yielding quagmire, which will in fact *float* the superincumbent weight of track and trains as a vessel is buoyed up by the water under and around it.

The *breadth* given to the bed of a railway is usually somewhat greater in excavations than in embankments, because, in the former, provision is necessary for carrying off the water which falls in rain or issues from springs, while the latter, being raised above the natural surface, require no ditches to keep them dry. The usual width of road-bed in America if designed for two tracks is from twenty-six to thirty feet, and of embankment from twenty-four to twenty-six feet. In England the humidity of the climate demands more breadth in cuttings, for better drainage. One who has traveled upon the railways of that country will be struck with the agreeable aspect of the road bed and slopes nicely trimmed to an uniform angle and neatly sodded, the drains kept clean and every thing in sight in perfect order; while in our country he has generally seen gullied declivities on either side deepened by every rain, ditches filled with what the last shower has washed into them, or the ragged edges and furrowed sides of embankments, with very scanty margin outside of the rails to receive a car should it leave the track. Deficient capital and hasty construction are our apology for their imperfections, many of which will doubtless in time disappear, but in our comparatively hot and arid climate we shall probably never see our roads bordered by the verdure of England.

TO BE CONTINUED.

—The people of Troy, Ala., a short time ago manifested their eagerness to obtain a railroad by turning out as they might to a "raising" in order to assist in framing a large trestle on a railroad which is in course of construction toward their town.

HINTS ON TRACKLAYING.

BY WILLIAM S. HUNTINGTON.

Tracklaying is generally performed in a careless manner, with little or no regard to wear and tear of track and rolling stock, the main object in view being to get over the ground as fast as possible so as to put the road in operation, when all defects may be remedied. This would all be well enough, if the remedy was sure to be applied; but this is very seldom the case, and track once poorly laid is generally allowed to remain so until safety demands a thorough overhauling, which can only be done at great expense and inconvenience. Indeed there is no remedy for some of the defects of poor tracklaying, after the road is put in operation. Of course the ballasting can be done, the track put in good surface and line, the ditches and water courses cleaned out, and the road put in good running order for the *present*; but if the ties are improperly laid, crooked iron laid on straight line, or if the iron is not sufficiently curved on curves, or the iron allowed to run ahead on curves, the inner rail getting so far ahead as to bring the joint ties diagonally across the track, (and this is very frequently the case), there is no remedy for it except to tear up the track and relay it, which is too expensive an operation and is never done until the ties are so decayed or the iron so worn as to require removal, which operation must be performed much sooner than would be the case if the track was properly laid at first.

Another matter of importance in connection with hurry and carelessness in tracklaying and which is generally overlooked by railway managers is the selection of cross ties. Cross ties should be of uniform length, breadth and thickness. If they vary in length, the rail on the one side of the track gets an uneven support and will settle out of surface, while that on the other will remain in good surface, making a disagreeable track to run over. If they vary in thickness, it causes trouble in frosty localities, as the action of frost is not uniform but varies as the ties vary in the depth they enter the ballast. Much mischief has been done by frost breaking away under the thinner ties while it remained solid under the thicker ones, as trains were passing over them. The action of water settling under cross ties where they vary in thickness often causes a serious disturbance in the surface of track by the gravel washing out from under the thick ties, while it is not disturbed under the thin ones, thus rendering it difficult to keep the track in good surface. If they vary in width and are laid the same distance apart from centre to centre, the rails get an uneven support, to the great damage of track and rolling stock.* Any one standing by the side of the track while a locomotive is passing slowly will observe that the drivers spring the rail most where the narrow ties are, or, in passing from a couple of wide ties over a few narrow ones placed adjoining them, the narrow ties settle into the ballast farther than the wide ones, and the drivers seem to be running down hill, and on approaching wider ones, run up hill, and so on, rising and falling as the ties are wide or narrow. If the rails were made of a material that would retain its shape after they were sprung out of surface by a locomotive, they would present an appearance similar to the waves of the ocean in a gentle breeze. Running over such track is far more expensive than where ties are of uniform width and laid equal distances apart.

With ties of uniform length, breadth and thickness, it is possible to lay a track that a locomotive will run on as smoothly as a ball on a billiard table, which is certainly very desirable.

Laying ties is not an operation that requires a great deal of mechanical skill, and probably most tracklayers would consider any hints on the subject superfluous; yet there are matters of great importance connected with the operation that are overlooked by tracklayers generally, and we propose to point out some of the most serious faults in laying ties as generally performed.

Tracklayers do not generally take sufficient pains to lay ties at right angles to the rails. Thus the ends are brought near together on one side of the track, and wide apart on the other, resembling the letter A. At the next space the letter is reversed. This gives a good support to a portion of the rail on one side, while the rail on the opposite side has no support; and as these conditions are reversed in the next space, is causes a disagreeable rocking motion to rolling stock, and also causes unnecessary wear to track and rolling stock. Ties should be laid at right angles with the rail, and with a view to giving the rail a continuous uniform support through its entire length.

Side ties (ties next the joint) should be of equal width and laid the same distance from the joint, otherwise the joint tie will be likely to roll somewhat to one side, and

* If these are not furnished of a uniform width, they should be assorted when laid so that all the ties in a set, or length of iron, will be of the same width.

thus form a "cocked joint," and cause the iron to wear rapidly at the joint. The truth of this may be seen by any one who will take a walk of a few miles on almost any railroad in the country. It will be observed that the ends of rails at all joints having side ties properly laid will be in good order, while those having one side tie nearer than the other to the joint tie will be battered and broomed, being subjected to a pounding from every wheel that passes. By paying proper attention to laying side ties, the iron will last much longer than when laid in a careless manner, and it would be a great saving to railway managers if they would see that more care is exercised in this respect than is generally the case.

LAYING TIES ON BRIDGES, TRESTLE-WORK, ETC.

There are some splendid railway bridges in this country, built at enormous expense, which are greatly injured because the ties on them are improperly laid. In many cases the engineer who has charge of the building of bridges is miles away when the track is being laid, and that work is in charge of those who give little heed to the manner in which the ties are laid. When cross-ties are used on bridges, they should be laid by a mechanic, with great nicety, as this is essential to the life of the bridge. In adzing them down to a uniform thickness, great care should be taken that there is not the slightest variation; and, although it is usual to use sawed ties on bridges, they will be found to vary considerably in thickness, so that every tie should be carefully measured before the iron is laid. It is not uncommon to find track laid on bridges where the ties were not properly fitted, and shims used to level up with. The shims are often made of soft wood and are worthless, or they have worked out of place, thus leaving the rail with only a bearing on every third or fourth tie. This should never be allowed, as it causes great strain and vibration, and injures the structure. Cross-ties should be securely fastened, so that they cannot slip or jar out of place. Frequently three or four ties may be found out of place and so close as to touch each other, while the rail has no support for several feet. Of course such things would not be looked for on some of our first-class roads; but they are far too common in this country, both for the good of the railway community and the public.

Every joint tie should be adzed down the thickness of the chair (when cast chairs are used), so as to bring the bottom of it on a level with the others. When thick cast chairs are used and the tie is not cut down, the bottom is brought lower than the others, giving water a chance to settle under it, and causing the ballast to work out from under it, making it difficult to keep in surface.

Managers of roads now in course of construction can save thousands of dollars by exercising a little care in the selection of ties and having them properly laid; and on old roads, where decayed ties are being removed, or new iron laid, the above hints may be acted upon to good advantage. This has been the practice of late, on some of our leading roads, and they find that when ties are properly laid the iron lasts much longer, expense of repairs to track and rolling stock is much reduced, and there are fewer accidents. Other roads should go and do likewise.

LAYING IRON

Is an operation that should be performed in a far different manner from what is generally practiced, and it is somewhat singular that so expensive an article does not receive better treatment. Much iron is rendered unfit for use by rough handling. It is often bent by being carelessly thrown from cars, and laid without being straightened, or it is thrown to one side as useless, and afterwards covered with gravel or mud, and lost. A great many thousand dollars' worth of iron are lost and destroyed by bad handling every year throughout the country.

CURVING IRON.

It is customary, with most tracklayers, to curve iron by dropping it as it is drawn from the iron cars when laying it. This is a bad practice, as it is either curved too much or not enough, or, as is generally the case, it is not curved at all, but only gets an elbow in the middle of the rail, while from the middle to the ends it remains perfectly straight. Sometimes, on slight curves, the iron is curved after spiking, by throwing the curve into it without with lining bars. This makes a very handsome track for a short time, but the iron will soon regain its former shape, and become straight. Straight iron wears rapidly on curves, and it is difficult to keep in line. Iron should never be laid on curves until it is properly curved, and, if no curving machine is at hand, it can be very nicely done with the old-fashioned apparatus, viz: a chain, lever and sledge, a couple of ties, and a fishing-line.

LAYING IRON ON CURVES.

It is well known that the inner rail on curves will "run ahead" so as to bring the joint tie diagonally across the track. This has the effect to throw the joint tie nearer to the side tie on one side of the track, and farther on the other, forming the letter A as above-mentioned, also causing a "cocked joint;"—that is, the side tie being nearer to the end of one rail than to the end of the other, the end of one rail is raised a trifle above the other, and soon becomes battered and spoiled. Another evil in allowing iron to run ahead is the disagreeable rocking motion it imparts to rolling stock, especially if the track is not in good surface. When track is out of surface, the joints are sure to be low, and the wheels pitching into a joint on one side, a little before reaching the opposite joint, cause a twitching and jerking from side to side, which is very disagreeable, and altogether unprofitable.

The inner rail should be cut frequently, so as to keep the joints as square as possible. It is a good plan to cut three inches as often as the iron gets ahead two inches. This will keep the joints all right. It is no uncommon thing on some roads to find iron run ahead fifteen to twenty inches, and sometimes two feet. This is a bad practice, and should be avoided.

EXPANSION OF IRON.

Many serious accidents are caused in this country in the summer months by the expansion of iron. These accidents are not confined to what are called "one-horse roads;" but frequently occur on some of the best managed roads in the country. In the month of July, 1867, eight serious accidents occurred in one day, all caused by expansion of track iron! Several lives were lost, and the damage amounted to an enormous sum. Probably there is no more fruitful source of accident than expansion, and this seems rather singular, since it is fair to presume that there is not a track-layer or section-master in the country but is aware of the property of iron. These accidents may be prevented by making provision for expansion, especially when laid in cold weather. When cast chairs are used, it is customary to drive the rail to place with a sledge, and a chip of wood or little sliver is placed between the ends of the rails, to keep them open a little for expansion. This is of no account, for a blow of the sledge will smash the chip or compress it to the thickness of a sheet of paper, while a space should be left of an eighth of an inch or more, according to the length of the iron and the temperature of the weather. In laying twenty-one foot iron in winter, a space of at least one-eighth of an inch should be left at each joint, and if very cold, one-fourth of an inch is not too much for twenty-eight foot iron. The length of iron and temperature of the weather should always be taken into consideration. Probably one cause of tracklayers neglecting to make provision for expansion is the fact that years ago the iron was only about half the length of that now in use, and in laying long iron they only make the same provision that they did for short iron. It is said that a continuous line of track five hundred miles in length will expand one-fourth of a mile. Railway managers will do well to see that all track-men in their employ are posted in this matter, and as different rules are needed in different parts of the country, the matter should be attended to by engineers, each in his own locality.

Another cause of trouble from expansion is in replacing iron that has been repaired. In welding the ends of battered rails, they are frequently left a trifle longer than they were before, and when they are replaced in the track they take up all the space, leaving no room for expansion. It is a common practice for repair-men to put in mended iron by squeezing it in perfectly tight. In such cases they are sure to have trouble in hot weather. Men in charge of repairing rails should have a gauge, and never allow a rail to leave the shop the merest trifle longer than when it came in, except for a particular purpose.

RAILWAY SKETCHES.

BY PAUL STORK.

Whenever we succeed in eliciting an expression of opinion from any one of the multitude of men engaged in commercial pursuits, we find, with only now and then an egotistical exception, that in their estimation other branches of business are pleasanter and more important than the particular one that engages their attention. It is the reverse of this with railway officials. Upon every railroad each human atom that goes to make up the whole is happy in the belief that he is the very identical fly, that, revolving with the hub, creates all the dust that is seen.

The tally-man, as he gravely reviews and carefully weighs and classifies the incoming freight, and assigns it to its particular place or car, has, deep down in his innermost soul, a sentiment of profound compassion for the mechanical duties of the manifest clerk; but the manifest clerk receives the tally-man's book with the very tips of his dainty fingers, grumbles at his tardiness, and pronounces his chirography execrable, as he proceeds to address his manuscript in a bold, resplendent hand to the station whither the goods are destined; afterwards progressing with less waste of ink, he marvels, as he rapidly carries out the different rates and charges, that freight conductors, with their easy duties and their boorish manners, should be so much better compensated than he with his fine accomplishments and complex duties, involving the revenues of the road; but the freight conductor, his train in line and his time almost up, raps fiercely on the counter, threatens to report his inconvenience to the train dispatcher, and wonders within himself why so unimportant a matter as the manifest is permitted on the line, when cards would be so much better. The explanation of the agent he thinks patronizing, and filled with wrath and secret scorn for all manifest clerks and station men, he excitedly signals his engineer, an old shunting man, to go ahead. The engine-man, drilled to obey but thoroughly alive to the superior dignity of *his* position, winks facetiously to the stoker as he slowly pulls the throttle. He will surely and terribly snub that same upstart of a conductor before he gets through with him. Meantime, as the train goes thundering along down the steep grades and over the high bridges the section men modestly standing beside the track glory in the concious knowledge that but for their great care this greasy engineman who sits perched upon his seat, for all the world just like a squatty bull frog, and squirts the dirty water in their faces as he passes by, would be in such a fix that he would call right loudly on them for aid. But while each and every one of these good people are thus pleasantly contemplating from their several stand-points the special importance of their own particular calling, and are no doubt, very useful in their places, the dusty brakeman, he of the horny hands, sits high aloft, his legs dangling from some friendly brake, dreamily watching the bobbing and courtseying cars, and speculating deeply upon the equity of a system that views the really responsible guardian of the train as an inferior; and when he remembers, as he often does, the superior air and the tremendous style of that tremendous man and fifteenth wheel, the caboose brakeman, he boils all over with the deadliest hate, or chuckles with the most profound contempt.

Then there is the train dispatcher. He is autocratic, savors strongly of the military, and looks upon all men not connected with the movement of trains as excrescences hanging on the verge, quartermasters and non-combatants, to be tolerated may be but of no particular account. The dispatcher delights in complication, and a delayed passenger train instantly awakens him into life. We find him with brows contracted sitting at the instrument, or with moody mein restlessly pacing the floor, mentally calculating the distances and their many grades or studying the position of the hurrying trains, and with a happy genius, inspired by a vigorous brain, from time to time flashing his instructions along the fragile wires. With the responsibility of many lives hanging in the balance, like a practiced strategist he confidently surveys the field. For his vehicle he has the lightning, and for his instruments blind men. However black the night or tangled the web, no train escapes him; and at sunrise the sleepy passengers, just arrived, yawn vacantly in his face, and perhaps mistake him for some needy porter. The happiest, as it was the most exciting epoch of my life was a few chance months, when a lad, spent at the telegraph instrument, acting as operator to a train despatcher; and an abler, clearer-headed, kinder-hearted man never kept a lot of sleepy operators up all night. All the responsibility that he felt was multiplied indefinitely in me, and well do I remember the stern, cold, dignified reserve with which I crushed, yea, nipped in the very bud, the friendly advances of the poor *country* operators. Never have I been so deathly sick or so supremely happy as when, with leg thrown gracefully across the table, I soberly smoked the beastly strong cigars that the dispatcher used to give me, quite innocently I then thought, but with years has come a strong suspicion, strengthened by many facts not then remarked, that this same kind-hearted train dispatcher was only having a little private joke with his cigars. It's really quite astonishing how suspiciously we come to view the kindliest actions as we grow older.

But did the curious reader, on some pleasant morning, ever watch with bated breath or cool indifference the excitement or the useless scramble that ever characterizes the surroundings and the make-up of a passenger train. Its sturdy coachmen with their clean white paper collars and their countenances of stoical unconcern are sights well worth seeing. What railway man has not remarked the local dignitary, as he paces the platform slowly up and down, ever and anon speaking a word of deep significance to some lesser mortal; but usually he stands aloof with folded arms, looking on with silent and tremendous dignity. Power and its terrible consequences have isolated and withdrawn him from the genial throng, and he stands before us a cold, hard monument of responsibility. Upon the base of this sad figure is cut in

big, round letters, so all may see, the trite old saying, "familiarity doth breed contempt."

But who is this that passes by with such enormous strides? Ha! it is the Auditor; he of the migratory title, not the Auditor *per se*, not him of the timid aspect and watery brain, who by much writing of the company's name, has come to look upon it as his own, and by a process of reasoning quite peculiar to his office, thinks that none but good penmen should ever be employed; not he, but the *traveling* Auditor, that bird of passage, that species of the *genus homo* indigenous to this favored land, who, like another wandering Jew, roams at random over its broad surface, ever seeking for his mortal foe, the unfaithful or delinquent agent. He rides on every train but let us not attempt to follow him, lest he lead us into danger; for 'tis whispered by the knowing ones that he sometimes hunts his enemy with gun and trusty dog.

REQULATION OF FARES BY LAW.

FROM THE MASSACHUSETTS COMMISSIONERS' REPORT.

General laws in relation to fares are now to be found in the statute books of very many of the States. The usual limit which has been fixed upon, as not too onerous on the traveling public, and at the same time sufficiently remunerative to the railroad corporations, is 3 cents per mile. In New York the limitation is fixed at 3 cents per mile, with a particular exception as regards the New York Central, which is limited to 2 cents per mile on all distances, and the Hudson River road, which is limited to 2.5 cents for four months of winter, and 2 cents for rest of the year. Even this limitation, low as it really is, being scarcely the equivalent in gold of an English half-penny for first-class travel, would seem to have been found amply remunerative, as those lines, while operating under it and continually complaining of the hardship of the exception, and seeking to be relieved of it by legislation, have been made a source of great profit to their owners. The experience of these roads is, indeed, much to the point. According to their recent showing, it would seem that, though running on their lines through trains at great cost and speed, they had yet amassed in other years sufficient undivided earnings to warrant, in the opinion of their managers, recent additional stock dividends of one hundred and seven per cent. upon the first, and about one hundred and thirty-five per cent. on the last, upon which they profess great confidence in their ability to pay in future even larger dividends than they have been in the custom of paying on the original stock. The experience of roads in other localities is to the same effect. In Pennsylvania, in Illinois, in Michigan, and indeed in almost all the States where the laws establishing a maximum of fares are in force, large stock, in addition to regular cash dividends, have, during the last few years, been made on the principal lines. It cannot well be argued that a limitation—a *maximum* not found oppressive in the States referred to—would prove so in Massachusetts. Unquestionably, if the New York Central road has been operated profitably on fares limited to 2 cents per mile, the Boston & Albany could be. The last-named corporation is certainly estopped from denying that the New York Central was profitably operated even under that limitation, inasmuch as the president of the Boston & Albany road, being likewise a director of the Central, voted as such to make the large stock issues, just referred to, on the ground that they represented undivided earnings paid into construction. It is interesting to examine, in the light of this action of the official in question, the existing tariff of the Boston & Albany road. Under the limitation he has found so very profitable in New York, as a director, the present fare from Boston to Pittsfield, on the road which he manages as President, would be reduced from $4.75 to $3; that from Springfield, from $3 to $2; that to Worcester, from $1.35 to 90 cents; that from Worcester to Clapville, from 40 cents to 17 cents, &c., &c.

Such general and sweeping laws as those referred to, the Commissioners regard as in no respect a satisfactory or final solution of this important question, either as regards the traveling public or the corporations. It is not improbable that the true policy for establishing the relations for passenger transportation between the community and the railroad corporations may be found in a system of special tariffs, arranged for a term of years, between each road and the representatives of the community, which shall apply only to the particular line contracted with, and which will be framed with a view to the circumstances under which and the region through which the road is operated. The details of this or of any other system, likely to prove satisfactory to both corporations and community, would require far more time and consideration to elaborate than the Commissioners have yet been able to give to the subject. No system which could be recommended would have any chance of working beneficial results, unless it had been arrived at after careful analysis and comparison of results, and opportunity had been given to the corporations to make themselves heard in regard to it. The objections to a general limitation law are that it ignores certain fundamental principles of railroad economy. Where, for instance, all travel pays at the same rate per mile, all persons do not pay for what they receive—some paying too much and others too little. Slow and cheap travel is, by a system of averages, made to support rapid and costly travel. This distinction is very important to a community like that of Massachusetts, where local travel is of peculiar importance and requires especially to be encouraged. For slow, local trains, traveling in the neighborhood of great cities, frequently stopping and discharging and receiving passengers, two cents a mile, in currency, would probably be found an ample remunerative rate; for rapid, through trains, traveling at twenty-five to forty miles an hour, seldom crowded, stopping rarely, and depending wholly on long travel for support, even four cents a mile would not be found an excessive charge. A general law, again, does not at all discriminate between the different classes of business which roads were built to accommodate. A road running between Boston and Lowell, or Boston and Salem, and especially designed for passenger travel, can and should afford to carry prssengers at more favorable rates than other roads, running by different grades or through sparsely-settled regions, and originally intended perhaps for the transportation of heavy freights. Or, from another point of view, take the important question of terminal accommodations in the city; the passenger for the shortest distance has the same amount of use of them as a passenger for a longer distance. Rates should, indeed, be largely made up of two kinds of expenses—the fixed expenses, which are the same for every passenger, and those which vary with the distance traveled. In regard to suburban travel, the first class of expenses should have altogether the most influence in regulating fares; the variation in the latter class is very slight. In fact, the cost of carrying passengers to all points within ten miles of Boston is very nearly the same to the roads. This element of fixed expenses must be more fully recognized whenever any systematic regulation of fares is attempted, and the diminution in charge should be considerably greater for long than for short travel, speed being the same. All exceptional circumstances, such as cost, grade, &c., affect, also these elements of the problem.

A series of discriminating laws, applicable to the several individual roads of the Commonwealth, and based on these varied considerations, could not, however, now be framed, even if it were expedient to impose them on the corporations. Meanwhile the Commissioners are of opinion that the tendency of a general law, could it be enacted, would be in the right direction. While it would in no case impose an additional burden on any description of travel, it would remove a heavy burden from certain descriptions of travel. A form of such a law as the Commissioners would recommend will be found in Appendix H to this Report. Before making any remarks explanatory of the provisions of this proposed law, the Commissioners wish to say that they offer it rather as a measure which would, in their opinion, be beneficial, than as one the adoption of which is now practicable. The laws of the State, though framed with a view to the protection of the public, are found in practice to possess peculiar efficacy for the protection of the corporations. The Commissioners do not propose to discuss the law authorizing the State under certain circumstances to purchase the railroads. Should the State ever undertake to obtain possession of a railroad, it may not improbably be found that the terms for so doing, originally fixed by the State for its own protection, will, from the difference between dividends actually paid and the ten per cent. per annum secured by law, in case of purchase, compel the State to buy the property at a price far in advance of the market quotations of its stock. It is not generally known that the recent enormous scrip dividend on New York Central only increased the volume of stock to that amount which the State of New York would have to purchase at par, if it desired to take possession of that road under a law precisely like that in force in Massachusetts. So in Massachusetts, again, another form of this same ten per cent. law now stands in the way of the measure suggested by the Commissioners. By section 112 of chapter 63 of the General Statutes, it is provided that "the Legislature may, from time to time, alter or reduce the rates of toll according to the provisions, if any, contained in the charter of the corporation: *provided* that such tolls shall not, without the consent of the corporation, be so reduced as to produce, with all profits, less than ten per cent. a year."

The existence of this law is a practical barrier against the enactment of the measure proposed by the Commissioners, inasmuch as many railroads of this Commonwealth earn less, and none divide more than the stipulated ten per cent. It is true that the proposed law would, probably, not reduce net earnings, but the Legislature has limited its right of regulation to circumstances which do not seem likely to arise. Whether the Legislature could, if it saw fit, repeal this law under its general reserved power, to alter, amend or repeal all charters (General Statutes, chap. 68 § 41), is a legal question, which the Commissioners do not care to discuss. Meanwhile, an escape from the difficulty may not impossibly be found in the future, in a total repeal of the ten per cent. laws, and the adjustment of special tariffs with the several roads for fixed terms of years, and with their consent. The State could then retain the power to purchase the roads on an appraisal, or at a fixed price. The corporations would be secured for a term of years in the right to operate their roads on a fixed tariff, and would be free to divide all the profits they could earn; in such a case, of course, excessive profits could only be earned by largely increasing the volume of business. This subject, however, the Commissioners must reserve for future discussion, as any change in the ten per cent. dividend and purchase laws will be found to involve the whole railroad system of Massachusetts.

The form of law imposing a maximum upon, and otherwise regulating fares, which will be found appended to this Report, differs from the laws now in force in other States, particularly in providing for the sale of season and package tickets at a maximum price.

The Omaha and Council Bluffs Transfer.

We are happy to be able to inform our readers and the public at large that the vexed question of transporting freight and passengers across the river at this point, has at last been arranged by the head officers of the different railroads converging here, to the complete satisfaction of themselves, and we hope to shippers and the traveling public. After discussing the matter in all its bearings, the following plan was finally agreed upon: Four separate tracks are to be run as near the banks of the river as is deemed safe, where a landing will be made, which is to be kept good at the expense of all the roads. From the track to the landing a covered plank roadway will be built, so that passengers can go dry-shod through any kind of a storm onto the ferry-boat, which is to be fitted up in good style, well provided with seats, etc., for their comfort. The Union Pacific Railroad is to fit up the opposite side in the same manner, and the passengers walk off of the boat to the cars, which will back down to river to receive them. The baggage will be transferred on this side to a baggage car, thus making only one handling of the baggage. This does away with all the delays that have been such a source of annoyance to through passengers, obviates the necessity of a long, tedious, and sometimes dangerous ride in omnibusses, and makes the transit more pleasant in every respect. The beautiful new steamer, H. C. Nutt, will convey the passengers and baggage, and will be expressly fitted up for that purpose. The transfer of freight will be so fixed that there will be no delay unless in case of an unusual flood of water, such as has never been known here. This saves all the extra expense of switching and hauling the freight cars, and reduces the expense of transportation one-half. These roadways and tracks to the river bank will be built above high water mark, and in such a manner as precludes the possibility of their being washed out by the river at any stage of water. We rejoice as must all who are interested in the well-being of this great transcontinental railway, which extends from the Atlantic to the Pacific, that at last passengers and freight will be subject to no detention whatever, and the extra expense of crossing the river will be done away with. The new arrangement goes into effect on the 1st of May, by which time all the tracks and roadways will be completed. We learn it is the intention of the Union Pacific Railroad to commence running two passenger trains a day from that date, and that a general change of time will be made on all roads.—*Council Bluffs Nonpareil.*

Designs for Locomotives.

The Rhenish Railway Company has opened a competition for designs for heavy freight locomotives. The conditions are given as follows in *Engineering:*

1. There are to be employed four-wheeled locomotives, with separate tenders.
2. The effort of the pistons must be transmitted to the driving axles by means of a well-constructed transmission.
3. Some means are to be devised by which the tender wheels can also be made available for adhesion.
4. When utilizing the weight of the tender for adhesion, the engine must be able to take twenty wagons of 10 tons each, up an incline of 1 in 70, at 7 miles per hour (11¼ kilometres.)
5. The engine must be fitted with an apparatus to prevent an excess of speed over the maximum velocity.
6. The engine is to be fitted with Le Chatelier's steam brake, or with any other counter-pressure steam brake.
7. The greatest possible simplicity and solidity of construction are essential conditions. The form of boiler is *a discretion.*
8. Detailed drawings, with dimensions, and descriptions relating to the construction, and notifying the adoption of particular arrangements, may be sent in up to the 1st of July, 1870.
6. The judges will be the Resident Engineer of the Rhenish railway, and three engineers who are actually, or have been locomotive superintendents of railways.
10. The rewards have been fixed as follows:

(*a.*) First prize.....1,000 dollars.
(*b.*) Second prize..... 500 "
(*c.*) Third prize..... 250 "

The competitive designs must be accompanied by the name of the author or by a motto.

Fitting Locomotive Tyres.

If the turning of wheel and tyre is well done, one fourth of an inch is enough to allow for the expansion of a tyre 16 feet in circumference without the "Griggs" patent wood packing; or in other words, the tyre should be turned out 1-16 in. less than the diameter of the wheel. The tyre should be placed upon the face-plate of the lathe, with its inner edge out, and should be so clamped as to allow this edge to be partially faced off for the purpose of affording a true guide to its position on the wheel. It is the practice in some shops, in putting on tyre, to place the axle on end, or the wheels horizontal; in other shops the tyre is put on while the axle is in a horizontal position. The former practice requires three rests to be adjusted to the rim of the wheel to hold the tyre to its true position while cooling off, care being taken that the rests bear only on the turning portion of of the tyre. The latter is the handier practice, inasmuch as no rests are needed. And the wheel requires to be raised but slightly, just enough for the thickness of the tyre to pass under. A temperature not far exceeding that of boiling water is sufficient to expand the tyre so as to go on easily. Cold water should be applied at once to the rim of the wheel, to prevent expansion and to bring the tyre as rapidly as possible to a like temperature.

The practice of fastening tyre to the rim of the wheel by means of several bolts, with long taper heads counter sunk in the tyre, should be abandoned. A much better method is to use three or four well fitted, inch, set screws through the rim of the wheel, corresponding cavities being made in the tyre for their ends; the cavities should be at least ¾ in. deep, and of uniform diameter to their bottom, and the ends of the set-screw should have a snug, straight fit, and should not quite bottom. This method leaves the tread of the tyre perfect, as far as bolts are concerned.—*F. G. W. in American Railway Times.*

—The railroad line between Bombay and Calcutta has been completed and is now open for through traffic.

General Railroad News.

MECHANICS AND ENGINEERING.

New Plan for an Elevated Railroad.

At a meeting of the Polytechnic Club of the American Institute on the 21st inst., Mr. Robert A. Cheesbrough presented a novel plan for operating city elevated railroads, in which the motion is to be obtained by the use of inclined planes. We find it described as follows: "A "double track is supported by steel ropes from the tops "of a series of iron pillars. The tracks are not horizon- "tal, but inclined in opposite directions. The elevation "of the track above the street is to be twelve feet at the "lowest point, in half-mile sections; the elevation of the "highest point about twenty-three feet, giving a fall of "ten or eleven feet to the half mile. This descent, it is "calculated, is sufficient to give a speed of say fifteen "miles per hour. By increasing the grade, the speed "may be made as great as is desired. Air, or hydraulic "lifts at the bottom of the inclines, are used to raise the "car to the top of the next incline. By this means, gravi- "ty is used as a propelling power, and a single engine and "boiler will be able to do all the work. The cost per mile "is estimated at $45,000. The inventor thinks that the "road can be operated so cheaply as to carry passengers "for one cent per mile."

Bridging the Tay.

The North British Railway Company proposes to build a bridge two miles long over the Tay, at a cost of £350,000 or more—probably more. It will decrease the distance between Edinburg and Dundee to forty-eight miles.

Viaduct over the Tees.

The *Journal of the Franklin Institute* describes as follows a viaduct constructed over the river Tees near the village of Cleasby, in the county of York, for the Merrybent & Darlington Railway: "It consists of three "river openings of 75 feet clear span, with two land "arches in the abutments. It is constructed for a single "line of railway, and is 15 feet wide between the "parapets. The piers in the river consist each of two "cast iron cylinders 8 feet apart from centre to centre, "and 6 feet 6 inches diameter up to the level of the bed "of the river, at which point they are gradually con- "tracted, in a distance of 3 feet to a diameter of 5 feet. "These cylinders are cast in 8 feet lengths, and are braced "together near the top by a cast iron frame, accurately "fitted and bolted to each cylinder. They are filled with "concrete to the level of the bed of the river, and above "this they are built in with solid brick work, and "terminate at the level of the girder-beds by an orna- "mental corner of ashlar, on which the girders rest. "Owing to the nature of the strata it was found neces- "sary to sink these cylinders by means of pneumatic ap- "paratus to the rock which underlies the bed of the "river at a depth of 30 feet. The abutments are built of "solid masonry with brick arches.

"The superstructure consists of two main lattice "girders each 90 feet in length and 8 feet in depth. "These girders are placed 8 feet apart with transverse "beams of timber 12 inches × 9 inches laid at distances "of 3 feet 3 inches, and projecting 3 feet 6 inches beyond "the side of the girders."

—Dr. T. A. Hoffman, of Beardstown, Ill., has patented an apparatus to prevent the overheating of grain, which he describes as follows: "This apparatus consists in "one or more rows of perforated tubes, joined together "according to locality, and placed in or near the center "part of the grain in bulk, stored in warehouses, bins or "vessels in transitu. From the lower row a connection "is made by a non-perforated tube with an exhausting "fan, making from 1,200 to 1,500 revolutions per minute, "which can be worked by hand or steam. By this "means the air from the center of the grain in bulk is "first removed through the perforated tubes and blown "out by the exhauster when in operation, the conse- "quence therefore is, that a current of air from the out- "side and the surface of the grain in bulk is drawn to- "ward the center, and from there through the perforated "tubes expelled by the exhauster, preventing in this "manner the grain from spontaneously heating. This "current will continue through the grain as long as the "exhauster is in operation. The preference of this ap- "paratus for the different kinds of complicated dryers "and ventilators is clearly developed. The apparatus "can be arranged in any vessel fit for transporting grain "in bulk, and can easily be removed from one locality to "another, and a few hours' operation might be sufficient "for one or more days to keep the grain in its normal "state.

"The air that can be drawn through a bulk of grain "in this manner is about as follows, viz.: Tubes of 2 "inches diameter will disengage 176 cubic feet per min "ute, or 10,560 per hour. Tubes of 4 inches diameter "will displace 883 cubic feet per minute, or 52,980 cubic "feet per hour. Tubes of 8 inches diameter will exhaust "3,531 cubic feet per minute, or 211,800 cubic feet per "hour."

LOCOMOTIVE STATISTICS.

Michigan Central.

The following is the report of the general average of performance of locomotives on all divisions of the Michigan Central for the month of March, 1870, as made by A. S. Sweet, Locomotive Superintendent:

Number of freight cars drawn one mile,	1,793,873
Equal to cars drawn over entire line,	6,316
Number of freight cars down one mile in February	1,768,493
Equal to cars drawn over entire line in "	6,279
Number of miles ran to 1 pint of oil	13.63
Number of miles run to one cord of wood,	33.59
Number of miles run to 1 pint of oil in February,	14.79
Number of miles run to 1 cord of wood, "	33.94
Average number of miles run per ton by coal-burning engines	36.59
Average number of miles run to one ton of coal in Feb.,	40.91
Average of freight trains—cars	20.51
Average of freight trains in February—cars	22.08
Number of gallons of oil used,	1,892¾
Number of cords of wood used,	4,339
Number of tons of coal used,	1,757
Number of miles run by passenger trrains,	72,145
" " freight trains,	86,862
" " miscellaneous trains	13,096
" " training engines,	34,259
Total	206,362

Toledo, Peoria & Warsaw.

The following is the report of the general average of performance of locomotives on the Toledo, Peoria & Warsaw Railway for the month of March, 1870, as made by A. H. de Clercq, Master Mechanic:

Cost per mile for engineers, firemen and wipers	7.18 cts.
Cost per mile for repairs of engine	6.38 "
Cost per mile for oil, waste, tallow and rags	1.30 "
" " " fuel	6.57 "
Total cost per mile run	21.43 cts.
Miles run to pint of oil	19.01
" " ton of coal	45.40

The above includes all kinds of oil consumed and superintendence, and all other expenditures appertaining to repair of locomotives.

Average cost of oil $1.05 per gallon. Coal is charged at $2.75 per ton, and wood at $4 per cord. Whole number of engines 44, of which 11 made no mileage; 1 is rebuilding and 2 are undergoing thorough overhauling.

MISCELLANEOUS.

—Governor Hoffman vetoed the bill granting State aid to the New York & Oswego Midland and other railroads, and his veto was sustained. The Legislature adjourned without passing any of the bills for a New York underground railroad.

—In the Illinois Constitutional Convention, Mr. Wells, of Peoria, proposes the following as an article of the new Constitution:

"The right heretofore granted, or that may be here- "after granted, to any railroad company to impose tolls "for the transportation of freight or passengers, shall be "construed to mean the right to impose reasonable tolls "only, and shall never be construed to confer the right "to impose unreasonable or extortionate tolls. Laws "may be passed to allow any railroad company to "ascertain, through the aid of the courts, what are "reasonable tolls."

—The telegraphic line between Valparaiso and Buenos Ayres, across the Andes, will soon be erected. Messrs. Clark & Co., of Valpairaiso, have succeeded in arranging this most important enterprise; the first portion of the line is now being shipped in London for Rosario. As the Panama, West India & Pacific line will be extended to Peru, this will be united with the Transandine line from Valparaiso, and as the Argentine and Brazilian Governments have granted a concession for another cable, to be laid from the coast of Brazil to the West Indies, there will be in a short time a direct communication with the whole of South America by two lines. The telegraph between Valparaiso and Buenos Ayres will be constructed entirely with iron poles and the best materials that can be obtained in England. The Argentine Government has granted a subsidy to this telegraph company of £6,000 a year, and that of Chili will add at at least £2,000 more.

—The steamship "Edinburgh," the property of Messrs. Edward Bates & Sons, has just been fitted by Messrs. Laird Brothers, at their works, Birkenhead, for the service of the Telegraph Construction and Maintenance Company. Her dimensions are 290 feet long, 39 feet wide, and 26 feet deep; tonnage, 2,200 tons. She is now arranged with three large cable tanks; two of them being 33 feet in diameter by 23 feet deep, and the third 26 feet in diameter by 20 feet deep. Under the two largest of them there has been fitted an inner skin, forming a double bottom, for stowage of water ballast when the weight in the cable tanks has run out. There are also various other fittings and appliances, specially arranged for the telegraph work.

—Telegraphic communication with India is now so far perfect that electricity now outstrips the course of the sun, as it frequently happens that messages transmitted from Calcutta at noon, to London, are delivered by the Indo-European Telegraph Company at 10:30 a. m. The communication between London and Teheren (the terminus of the Indian Government lines) is actually instantaneous.

—The Pennsylvania Railroad Company have purchased the Niles Iron Works at Cincinnati, upon which to erect a new depot, in a few weeks.

—Mr. J. C. Stanton, Superintendent of the Alabama & Chattanooga Railroad, proposes to commence immediately the construction of a large and elegant hotel near the depot of the Alabama & Chattanooga Railroad at Chattanooga.

—In the Court of *Nisi Prius*, in Philadelphia, on the 23d inst., a preliminary injunction was granted, prior to argument, restraining the Collector of Internal Revenue from collecting income tax upon the dividend and earnings applied to the construction of the Philadelphia & Trenton Railroad. Ten or twelve leading railroads in Pennsylvania have refused to pay, and await the action of the Court.

—A general law was passed at the late session of the Ohio Legislature providing that the time for completing all railroads whatsoever now in progress in the State be extended five years from the date mentioned in the charters or any other special law fixing the time.

—Contracts were made at San Francisco on the 22d inst. between the Atlantic & Pacific Telegraph Company, of New York, and the Central Pacific, Western Pacific, and the Oakland Railroad Companies' telegraph lines of California, for an exclusive connection, for business, the Union Pacific Railroad having made a similar contract with the Atlantic & Pacific Telegraph Company last fall. These lines complete the routes from Omaha to San Francisco, and roads running from the latter city. At Omaha they are met by the Great Western Telegraph Company from Chicago, the wire now strung and the instruments now being put up on the route between Chicago and Omaha. It is expected the whole line from Chicago to California will be in operation very soon.

—St. Louis capitalists propose to organize a bridge building company for building wrought iron arch bridges. The proposed capital is $300,000, 20 per cent. to be paid in at the first.

—The "Griffith Railroad Bill," authorizing the cities and counties of Ohio to assist in building railroads, was not passed by the Legislature at its late session.

—The Ohio Legislature on the 11th inst. passed a general law authorizing all railroad companies of that State to issue preferred stock, guaranteeing dividends of not more than eight per cent., for such an amount as a majority of the stockholders may decide, for the purpose of redeeming any bonds of the company.

—John H. Bryant, who was President of farmers' transportation convention, and, by the way, is, we believe, a brother of William Cullen Bryant, the poet, writes to the Chicago *Tribune* a letter which contains the following paragraph: "There are multitudes of "honest, industrious citizens in this country—the very "foundation upon which the superstructure of our free "institutions is reared—who, though they could not per- "haps answer the arguments of ingenious attorneys and "sharp capitalists in favor of vested rights, who yet "know and feel in their inmost souls that they are "wronged and robbed by railroads and other soulless "corporations, and the day must and will come when "these fast multiplying thousands will have justice or "vengeance. God forbid it should be the latter."

—Last year the Iowa Supreme Court decided that towns and counties had no legal authority to vote aid to railroads. At the late session of the Iowa Legislature a law was passed empowering municipalities to vote such subscriptions. The Des Moines *State Register* makes the following comment: "The people will most cordially en- "dorse the action, and thank the Legislature for it. No "law of the session will be more popularly received, or "work more benefit to the substantial good of the State. "The great railway system of the country is now being "developed, and Iowa, to keep up with her sister States, "must weave her iron mesh with the rest, or let the day "of golden opportunity go by, and be forever left out. "Under the quickening power of this law, several of our "most important projects, which have been languishing "and dying, will be revived and speedily carried forward "to success. It is believed that the law will be sustained "by the courts. We trust that it may be, for upon it de- "pends much of the future greatness of our State."

—The City Council of Louisville has voted to pay a fee of $2,000 to Isaac Caldwell for his services in opposing the Cincinnati Southern Railroad Bill in the Kentucky Legislature.

OLD AND NEW ROADS.

Portland & Ogdensburg.

A great deal of our work on the road bed between Portland and Fryeburg has been done during the past winter, and it is expected it will be entirely completed for this fifty miles within six months. One-third of this distance is to be ironed by the middle of July. This is a section of a great through route between Portland and Chicago.

Great Western of Canada.

A telegram from Toronto on the 23d states that it is understood that the shareholders of the Great Western Railway accord their consent to a bill authorizing a branch road to be constructed from Glencoe east, forming a southern road, and that a double track will be laid on the Great Western road between Windsor and Glencoe. The new road will be commenced this season.

Pittsburgh, Fort Wayne & Chicago.

The Ohio Legislature appointed a committee to investigate the claims of the Pittsburgh, Fort Wayne & Chicago Railway Company, and that committee made a highly sensational report, affirming that no such corporation was known to the laws of Ohio, and recommending that proceedings be instituted to test the company's authority to operate the railroad within the State of Ohio. The Legislature received the report and quietly adjourned without acting upon it.

Michigan, Indiana & Ohio.

A company has been formed with the following incorporators to build this road: H. H. Sturges, Wm. Bushnell, Hubbard Colby, Willard S. Hickox, James S. H. Cook, and Henry C. Hedges, of Mansfield; Wm. Stough and E. G. Fay, of Bryan, Ohio; and Chas. Foster, of Fosteria, Ohio. The road is to pass through the counties of Williams, Henry, Fulton, Hancock, Wood, Seneca, Crawford, and Richland. It is to extend from Mansfield, O., to Sturgis, Mich., where it will connect with the Michigan Southern for the West, and the Grand Rapids & Indiana for the North.

Quincy, Alton & St. Louis.

It is reported that the President, Gen. J. W. Singleton, has made arrangements in New York to obtain advances of money sufficient to build the road before next November.

Quincy & Warsaw.

This road, it is reported, has secured the means necessary to provide for its construction this summer. Work will be commenced immediately.

Chicago & Danville.

Perryville, Fountain county, Ind., a town on the Wabash about twelve miles east by south from Danville, Ill., has voted to subscribe $75,000 in aid of an extension from Danville through its limits.

Chicago & Southwestern.

The New York *Independent* of the 14th says: "We are informed by Messrs Frank & Gans, of 14 Wall street, that nearly the entire issue of Chicago & Southwestern Railroad bonds (five millions) have already been advantageously placed in this market."

This places funds in the hands of the company sufficient to complete and equip the entire line. We learn from the Leavenworth *Bulletin* that the whole line is under contract.

Grading is going on rapidly between Washington and Fairfield. The Burlington *Hawk-Eye* says that the work is to be put through as rapidly as possible, and it is expected before the close of the present year to connect with the Burlington & Missouri River Railroad at Fairfield.

Cleveland, Zanesville & Cincinnati.

The Toledo *Blade* is "informed by reliable authority, "that negotiations are now being carried on between some "of the mining companies of Southern Ohio and parties in "the interest of Cleveland to complete arrangements to "make that city the lake outlet for the coal and other "minerals of Southern Ohio." To effect this the above road is to be extended from its present terminus at Millersburg to Zanesville, sixty-three miles. This would give the Pennsylvania Railroad Company a line of its own between Cleveland and Cincinnati.

Cleveland, Mount Vernon & Delaware.

The company offers its bonds to the amount of $1,500,000 in the New York market. They bear 7 per cent gold interest and are offered at 90. The advertisement states that "65 miles of the road have been com- "pleted and running for some time past, and of the bal- "ance 43 miles out of 66 are already graded." The road, we believe, is an extension or branch of the Cleveland, Zanesville & Cincinnati Railroad.

St. Paul & Chicago.

On the 19th the trains commenced running again, the water in St. Paul having abated so that their depot is once more accessible. A new time table went into effect that day, by which they leave St. Paul at 12 m., and arrive in Hastings at 1:15p. m. Returning, leave Hastings at 4:05, and arrive in St. Paul at 5:20

In Winona, Minn., the proposition to issue $100,000 of city bonds, in aid of the St. Paul & Chicago Railroad, was ratified on the 21st. by a very large majority. The conditions are, in substance, that the road must be completed from Winona to St. Paul (except the bridge at Hastings) in three years, and that the line from Winona to North LaCrosse, known as the "Eastern Connection," shall not be changed without the consent of Winona, and shall be completed in the year 1870.

The St. Paul *Pioneer* announces, upon good authority, that the whole line from St. Paul to Winona will be put under contract as soon as the necessary surveys can be made, and will, without doubt, be completed in less than two years.

Toledo & Lexington.

The contract for builiding the railroad from Toledo to Lexington, O., to intsrsect the Baltimore & Ohio Railroad was closed at Tifflin, O., on the 22d inst., with J. Edward Conant, of New York.

Warrensburg & Glasgow.

An effort is to be made to construct a line from Warrensburg, Johnson county, Mo., on the line of the Pacific of Missouri, in a northwesterly direction through Marshall, the county seat of Salina county, to a point on the Missouri river opposite Glasgow. The distance is about seventy miles. Warrensburg and two other townships nave voted $327,000 in aid of the project.

Pacific of Missouri.

An ordinance is pending in the St. Louis Common Council giving this company authority to extend its track along Poplar street to the levee.

LaSalle & Chicago.

A proposition to subscribe $75,000 to this road was voted down in LaSalle on the 23d inst. by a vote of 279 to 19.

Quincy & Carthage.

It is reported that Eastern capitalists have become interested in this proposed road and that its construction will be commenced by the 1st of June next and finished by next February.

St. Louis, Vandalia & Terre Haute.

The iron bridge over the Wabash at Terre Haute was completed last Wednesday, when the first train passed over it. It is 830 feet long. The line is now completed from St. Louis to Terre Haute.

Dubuque & Minnesota.

It is intended to build this road up the river from Dubuque to McGregor, about sixty miles, this year.

Sabula, Ackley & Dakota.

The proposed route of this road, between Sabula and Marion, through Maquoketa, Monmouth, Wyoming, Anamosa, Fairview and Springville, was lately examined by the engineers of the Western Union and Sabula roads in company. Their report was very favorable. The people of Grundy and Hardin counties announce that they are ready to begin grading through their counties as soon as the line is located.

Omaha & Southwestern.

The Omaha *Herald* learns that Mr. John A. Smiley has made a proposition to the Board of Directors of the Omaha & Southwestern Railroad Company to grade twenty additional miles of their line, provided the people of Sarpy county vote aid in bonds to the amount of $100,000.

Burlington, Cedar Rapids & Minnesota.

The Burlington *Hawkeye* says that work on the extension of this line north of Columbus Junction was resumed on the 15th, having been interrupted by high water and bad weather. Nearly all the grading has been done as far as the junction of the main line with the Chicago, Rock Island & Pacific Railroad, and the iron will be laid as soon as the bridge over the Iowa river is completed. The company expect to have the cars running from Burlington to Waterloo by next October.

Rockford, Rock Island & St. Louis.

The Rock Island *Argus* is authority that this company "have now built an aggregate of 175 miles of road, di- "vided among the several divisions as follows: Rock "Island division 70 miles; Mississippi division 20 miles; "St. Louis division 85 miles. The total length of the road "from St. Louis to Rockford is 323 miles which they ex- "pect to have completed and in running order by the 1st "of September. On the Rock Island division, they have "451 cars, of which 444 are box, flat and coal cars, 5 passenger and 2 Pullman Palace sleeping cars. Rockford Township voted this week to subscribe $50,000 to aid the construction of the road.

St. Paul & Dubuque.

The route of this proposed road is from St. Paul to Austin, curving eastward from an air line about as the existing road of the Milwaukee & St. Paul curves westward, and passing through Cannon Falls and Mantorville. For about twenty-five miles south of St. Paul its line is but a few miles from the Milwaukee & St. Paul on the West and the St. Paul & Chicago on the East. At Cannon Falls it is fifteen miles east of the Milwaukee & St. Paul, and at Mantorville twenty-seven miles. Thence to Austin the lines gradually approach. The Illinois Central looks upon this line with favor, as likely to afford it a route on which it can run cars through between St. Paul and Chicago, and the country on the line promises to subscribe liberally.

Northern Pacific.

A Minnesota paper reports that at a recent meeting of the company in New York, it was determined that Duluth should be the eastern terminus of that railroad, and that the portion of the line and land grants east of Superior, applying to the lake and southern connections should be surrendered to another company. Superior has been regarded as a possible terminus.

St. Paul & Sioux City.

The Blue Earth City *Post* says that this company "have contracted with Gen. Bishop and Col. J. L. Mer- "riam for building their line of road from Crystal Lake "to St. James, to be completed within eight months from "the 15th day of April. The contract covers the grad- "ing, bridging, ties, and all work necessary to prepare "the line ready for the iron. Though they have until "the 15th of December to complete the work, the con- "tractors expect to finish by the middle of November."

Work on the extension from the present terminus at Crystal Lake southwestward was resumed last week.

Missouri River, Fort Scott & Gulf.

The people of Chetopa, Kansas, are trying hard to secure the building of a branch of this road from their place to Columbus, a station on the road seventeen miles northeast of Chetopa.

South Pacific.

There is talk of building a branch of this road from a point in Newton county near the Kansas line due west, very near the boundary between Kansas and the Indian Territory.

The track was laid as far as Springfield, three hundred miles from St. Louis, on the 22d inst. It will be opened for business to that point with celebration on the 3d of May. Track has been going down at the rate of three miles a day, and this indicates that the road will soon reach the Indian Territory, where it will have unsurpassed facilities for carrying Texas cattle.

Michigan & Mansfield.

On the 20th this company was organized at Mansfield, Ohio, with a capital stock of $600,000. The proposed route is from Mansfield in a northwesterly direction through Crawford, Seneca, Hancock, Wood, Henry, Fulton, and Williams counties, reaching the State line near the northwest corner of the State, where it will be continued by Indiana and Michigan corporations to Sturgis, Michigan.

Macon & Knoxville.

A company has been formed in Georgia to build a railroad from Macon, Ga., to Knoxville, Tenn. The route is, for some distance, west of the Cemulga river, and near the line of the Macon & Western road, but it turns soon nearly due northward, though no route through the mountains is fixed upon. Indian Springs, in Butts county, and Leavenworth, the county seat of Gwinnett county are given as points on the line. Application will be made for State aid, without which the road is not likely to be built for some time at least.

Omaha & Lake Pepin.

We are informed of the existence of such a company by an announcement that an election of officers will be held at Plainview on the 10th of May.

Missouri, Kansas & Texas.

The rails are being laid south of Humboldt at the rate of a mile a day. It is expected that the grading will be completed to the State line early in May. R. E. Stevens, the General Manager, and Major Gunn, Chief Engineer of the road, were in Chetopa on the 13th and made arrangements for the location of a depot there.

Alabama & Chattanooga.

Besides the ninety miles completed at the Chattanooga end, about fifty miles are in operation from Meridian northeast to the Tombigbee river, and fifty miles more beyond the Tombigbee are graded.

Montgomery & Troy.

It is proposed to build a railroad from Montgomery, Ala., southwestward about forty-five miles to Troy, the county seat of Pike county. It would reach a country now destitute of facilities for transportation.

Flint & Pere Marquette.

The attempt to give this road an outlet to Toledo by way of the Monroe, Wayne & Holly road now in progress, and to effect permanent connections with it, seems to have been given up. It is now said that the proposed Toledo, Ypsilanti & Northern road will be favored, and that, while its chief outlet for eastern business will be by way of Toledo, the Michigan Central will serve as an outlet for westward business. An immense lumber business is done over this road, and it not unfrequently receives shipments to be transported by rail through to New York and Boston.

Union Pacific.

The application to appoint a Receiver for this road is pending in Cheyenne before the Supreme Court of the Territory. The case commenced last Tuesday.

Iowa Southwestern.

This is the title of a company recently organized in Iowa City, to build a railroad from some point on the Chicago & Northwestern near the west line of Clinton County, in a southwesterly direction through Tipton, Iowa City and Sigourney, to the Missouri river. The capital stock is $5,000,000. Ex-Governor Kirkwood, S. Sharpless, Rush Clark, C. T. Ransom and Robert Gorvin were elected Directors. Four more are to be elected. In Iowa its line would be parallel with and about twenty-five miles from the Chicago & Southwestern. If continued into Missouri on the same line, it would be much nearer the Burlington & Southwestern.

Kentucky Central.

The company is relaying its track with new English rails.

Cincinnati Southern.

The Cincinnati Board of Trade has recommended certain amendments to Senator Sherman's Cincinnati & Chattanooga Railroad bill, which will, if adopted, in the estimation of the board, enable the Trustees appointed to build the Cincinnati Southern Railroad, under the ten million loan, to enter upon the construction of the road under a national charter. As originally introduced the Trustees refused to favor it.

Lake Superior.

We learn from the Blue Earth City *Post* that this road is now completed to Kettle River, ninety-six miles, almost due north, from St. Paul, to which point trains commenced running on the 18th. The road is graded for twenty miles beyond, and as soon as the bridge across that line is completed, the track will be laid again at the rate of a mile a day. This leaves but fifty miles of staging from Duluth to Kettle River.

Leavenworth, Lawrence & Galveston.

We learn that representatives of this company have proposed to the people of Montgomery county, Kansas, to build the road through that county for a distance of twenty miles if they will vote $200,000 in its aid. The east line of Montgomery county is twenty-four miles from the line of the Missouri, Kansas & Texas Railroad, at Chetopa, and more than forty miles from that of the Fort Scott road at Baxter Springs. If built through Montgomery county the road will turn southwestward from Humboldt.

Southern Minnesota.

It is reported that the energies of the company will be devoted this season to completing the line to Wells by filling the gap of fifty miles between Lanesboro, the present western terminus of the eastern section, and Ramsey, where the western section begins. This indicates that there will be no extension from Wells, either west to Blue Earth City or northwest to Mankato, before another year.

New Orleans & Texas.

A contract was signed on the 12th inst. at the office of the Chattanooga Railroad Company in New Orleans, by which Messrs. Casement & Co., formerly contractors on the Northern Pacific Railroad, agree to grade the Chattanooga road from New Orleans to Donaldsonville. Work will be commenced at once.

Springfield & Northwestern.

The line has been surveyed from Springfield through Petersburg, Havana, Lewiston and Galesburg on the way to Rock Island. Three hundred and fifty thousand dollars have already been voted toward this line, as follows: Sangamon county $100,000; Menard county $100,000; Mason county, $50,000; and Lewiston and Fairview townships, in Fulton county, $50,000.

Toledo, Tiffin & Columbus.

The Railroad Trustees of Toledo have closed a contract with J. Edward Conant, of New York, for the construction of the Toledo & Woodville Railroad. Mr. Conant has also taken a contract for the construction of the line of the Toledo, Tiffin & Columbus Railroad, from Woodville by way of Tiffin and Crestline to Lexington, twelve miles below Mansfield on the Sandusky, Mansfield & Newark line (Lake Erie Division) of the Baltimore & Ohio Railroad. The new road will be about one hundred miles long and extend nearly due southeast from Toledo.

ELECTIONS AND APPOINTMENTS.

—There seems to be a great deal of feeling with regard to the election of officers of the Cincinnati, Hamilton & Dayton Railroad Company, which is to take place on the 24th of May. A meeting of stockholders opposed to the re-election of S. S. L'Hommedieu, the present President, was held in Cincinnati on the 22d inst., but it was there conceded that Mr. L'Hommedieu holds proxies enough to secure his re-election.

—S. B. Knight has been appointed Train Dispatcher of the Chicago, Rock Island & Pacific Railroad in place of C. Failing, resigned.

—F. E. Snow has been appointed general agent for the Michigan Central and the Great Western roads. Until lately he was agent of the Great Western at Detroit, and before was employed in the office of the Assistant General Superintendent of the Michigan Central. He succeeds Charles B. Bush, now Assistant Superintendent in charge of the Grand River Valley Division.

—The corporators of the Ironton, Portsmouth & Cincinnati Railroad Company have organized by electing the following officers: President, Colonel Kinney, of Scioto; Treasurer, E. P. Evans, of Adams; Secretary, D. McLouden, of Brown.

—At a meeting of the South Pacific Railroad Company, on the 28th inst., the following gentlemen were elected Directors: Francis B. Hayes, Uriel Crocker, Isaac Rich, Jacob Sleeper, Charles J. Morrill, and Geo. C. Curtis, of Boston; Andrew V. Stout and Joseph Seligman, New York; Frederick Billings, Woodstock, Vt.; William H. Coffin, Clyde, N. Y.; Oliver Ames, North Easton, Mass.; Andrew Pierce, Jr., St. Louis; Charles E. Harwood, Springfield, Mo.

—C. H. Hurd, who was some time ago appointed Assistant General Superintendent of the Michigan Central Railroad in place of W. K. Muir, has accepted and a few days ago assumed the duties of the position. His headquarters are in Detroit. Mr. Hurd held that office for some time and resigned on account of ill-health about four years ago. He is a very capable man and unusually popular in the community where he is best known.

TRAFFIC AND EARNINGS.

The following is a corrected statement of the earnings of the St. Louis, Alton & Terre Haute Railroad for the first three months of the year. They have been given erroneously heretofore:

Earnings Jan., '69..	$132,622 81	Jan., '70..	$152,392 75	Inc..	$19,769 94
Earnings Feb., '69..	127,817 55	Feb., '70..	158,784 66	Inc..	30,967 11
Earnings Mch., '69..	175,950 05	Mch., '70..	176,877 43	Inc..	927 38
Total.....	$436,390 41		$488,054 84		$51,664 43

In the reports for 1870 the earnings of the Bellville & Southern Illinois Railroad, twelve miles in operation, are included.

—The Western & Atlantic Railroad of Georgia, (Atlanta to Chattanooga, 138 miles) reports its gross receipts for the year ending Sept. 30th, 1869, at $1,138,300 62; the working expenses $688,180 43, and the extraordinary expenses $134, 015 32—making a total of expenses $822,-195 75, and leaving a net income of $316,105 08. Of the receipts, $801,805 55 were from freight, and $313,364 37 from passengers. Of the extraordinary expenses, $52,-250 were for new track, and $44,383 71 for new cars. The report says that the ratio of working expenses, deducting $21,383 37 paid on prior account, is 58 58-100 per cent. the ratio of the previous year.

—The earnings of the North Missouri Railroad, 406 miles, for the first two weeks of April were:

1870.....	$131,583
1869.....	81,802
Increase (37 4 5 per cent).....	$ 49,781

—The receipts and expenses of the Western Union Telegraph Company for the month of February were:

	Receipts.	Expenses.	Net Receipts.
1869.....	$575,249.07	$354,855.73	$220,393.35
1870.....	521,416.59	380,780.20	140,636.63
Decrease in net receipts (36 1-5 per cent).....			$ 79,756 96

Influence of the Suez Canal on Ocean Navigation.

Mr. J. D. Samuda, M. P., read a paper on this subject, at the first meeting of the recent annual session of the Institution of Naval Architects, London, from which the following is an extract:

"The canal connecting the Red Sea and the Mediterranean, is now an accomplished fact, and without change of vessel, and without half circumnavigating the globe, means now exist for passing from the Indian Seas to all the ports of Europe. The first meeting of the Institution of Naval Architects held next after the opening of the Suez Canal would be naturally desirous to take some notice of this important event, and it is with the view of considering the effects of the great engineering work on the commerce, and its probable influence on the mercantile marine of all nations, that I beg to submit some facts and circumstances in connection with it. By substituting the canal route for the old-established sea voyage around the Cape, the following savings in distance are obtained in a voyage to England: From Bombay, 5,770 miles; from Ceylon, 3840; from Hong Kong and Singapore, 3,520; from Melbourne, 91 miles. These savings are accomplished on voyages ranging from 12,000 to 14,000 miles in length. Roughly, therefore, the savings amount to about one-half from Bombay, one-fourth to one-third from China, and, practically nothing from Australia. The first thing that strikes one is the enormous saving of distance thus offered to some of the principal highways of traffic, and the benefit that must result to all carriers from availing themselves of this shorter route. But it had been foreseen, and is now universally admitted, that, independently of the difficulty and the expense of towing sailing vessels through the canal, the navigation of the Red Sea is so unsuited to them at most times, that the owners of sailing ships must regard the canal route as wholly unsuited to their use. Considerable depression has naturally resulted in this class of property, and the production of sailing ships since the opening of the canal has been almost if not entirely stopped. Is this depression to be temporary, and will the experience of subsequent working justify the conclusion it points to, of a general substitution of steam for sail in the great carrying traffic from the East? To arrive at any sound conclusion on this most important subject, it will be desirable to review by the light of our present knowledge, the capability of steam vessels for dealing with all or part of this new field suddenly thrown open to them. More, I would observe that if the opening of the canal had taken place eight or ten years earlier scarcely a cargo-carrying steamer of any sort would have entertained the idea of profitable employment on even the most favorable of the routes. But the interval of time has been so profitably employed by steamship owners realizing the importance of economy of coal and the improved proportion of vessels and engines, that voyages may now be undertaken with profitable results, which only a few years back would have been hopeless, except in cases where large subsidies were obtainable, to compensate the great cost of coals and working compared with the carrying powers of steamers then in use. The first great and important change in the character of cargo-carrying ocean steamers within my own experience, occurred in 1863, when a large foreign company, who had till then, on a 4,000 miles journey, employed vessels burning forty tons of coal a day, to carry 1,400 tons of cargo, were able to substitute them by vessels burning fourteen tons of coal, and conveying 2,000 tons of cargo. And the new vessels made nine knots of speed, actually averaging a higher speed than the old ones. The effect was so startling that it led to their entire fleet being gradually replaced by the economical vessels. I think that economical working of steam, applied to cargo-carrying, requires that coal should be, if possible, taken on board before leaving England, for both the outward and homeward trip. Our present experience shows, with a vessel of 2,000 tons, builder's measure, giving an average of nine knots, and burning fourteen tons per day, coal may be carried for the round voyage of 12,000 miles—6,000 out and 6,000 home, and leave space to carry 1,600 tons of cargo out, and 2,000 tons home. With these conditions it appears probable that a large amount of success may be accomplished. If this be so, we may regard as the natural consequence of opening the canal, that the whole or at least the greater portion of the traffic between Bombay and England will be lost to sailing vessels, and appropriated by steam. When, however, we deal with the China traffic, the difficulty for steam is much increased. Here, a complete voyage of 20,000 miles has to be provided for, and I cannot satisfy myself that the same beneficial results will follow. With exceptionally high freights, it may be possible to compete with first-class sailing ships; but as the same vessel referred to above would, as on this long voyage, under similar circumstances, only be able to carry 1,000 tons of cargo out and 1,800 tons home, it is doubtful if steam will do more than obtain a limited portion of the traffic, and that the superior clipper ships may look to retain their vocation for some time—that is, till further improvements in steam in the same direction as those that have been made in the last eight years, put them in the same position to compete successfully for cargoes on this increased length of voyage. Then, as regards the Australian traffic, where no advantage of distance whatever is to be gained by using the canal, and where the length of the voyage is again increased, I look upon the profitable employment of cargo-carrying steamers as at present impossible, and that route, of course, will be left to the sailing ships untouched. I am well aware that the drawing off of sailing ships from the Bombay route will cause a serious competition to those on the Australian station. I also think that the development of Indian railways will shortly bring to the port of Bombay much produce that now comes from Calcutta and other parts of India; and that, gradually and shortly, Bombay will become the great port of India for England. But as these latter changes are more or less matters of time, and as the life of sailing ships does not range over very many years, I do not see sufficient cause to justify the panic that appears to have overtaken this class of propriety; and I am inclined to think that their substitution and extinction will be much more gradual than the possessor of them apprehends.

The Northern Pacific Railroad.

The following is the text of a joint resolution concerning the Northern Pacific Railroad which passed the Senate on the 20th inst., and is now pending in the House:

Be it resolved, &c., That the Northern Pacific Railroad Company be, and hereby is, authorized to issue its bonds to aid in the construction and equipment of its road, and to secure the same by mortgage on its property and rights of property of all kinds and descriptions, real, personal, and mixed, including its franchise as a corporation, and as proof and notice of its legal execution and effective delivery, said mortgage shall be filed and recorded in the office of the secretary of the interior: and also to locate and construct, under the provisions, and with the privileges, grants and duties provided for in its act of incorporation, its main road to some point on Puget sound *via* the valley of the Columbia river, with the right to locate and construct its branch from some convenient point on its main trunk line across the Cascade mountains to Puget sound: and in the event of there not being in any state or territory in which said main line or branch may be located at the time of the final location thereof the amount of land per mile granted by congress to said company within the limits prescribed by its charter, then said company shall be entitled, under directions of the secretary of the interior, to receive so many sections of land belonging to the United States, and designated by odd numbers in each state or territory, within ten miles on each side of said road, beyond the limits prescribed in said charter, as will

make up such deficiency on said main line or branch, except mineral and other lands, as excepted in the charter of said company of 1864, to the amount of the lands that have been granted, sold, reserved, occupied by homestead settlers, pre-empted, or otherwise disposed of, subsequent to the passage of the act of July 2, 1864, and that 25 miles of said main line between its western terminus and the city of Portland, in the state of Oregon, shall be completed by the 1st day of January, 1872, and 40 miles of the remaining portion thereof each year thereafter until the whole shall be completed between said points; provided that all lands hereby granted to said company, which shall not be sold or disposed of, or remain subject to the mortgage by this act authorized, at the expiration of five years after the completion of the entire road, shall be subject to settlement and pre-emption like other lands at a price to be paid to said company exceeding $2.50 per acre; and if the mortgage hereby authorized shall at any time be enforced by foreclosure or other legal proceedings, or the government lands hereby granted, or any of them, be sold by the trustees to whom such mortgage may be executed, or default of said company under the terms thereof, such lands shall be sold at public sale at places within the states and territories in which they shall be situate, after no less than 60 days' previous notice, in single sections or subdivisions thereof, to the highest and best bidders; provided further, that in the construction of the said railroad American iron or steel only shall be used, the same to be manufactured from American ore exclusively.

SEC. 2. *And be it further resolved*, That congress may at any time alter or amend this joint resolution, having due regard to the rights of said company and any other parties.

PROGRESS OF KANSAS RAILROADS.

The opening of new railroads and the extension of former lines is to be the great event of our history this year. So we said and believed last year, but each season surpasses the last in the history of its material developments. The Kansas Pacific Railway is now approaching the center of Colorado, and will be completed to Denver by the first of August. Its incalculable benefits to us are taken as a matter of course, and we make little note of the fact that it runs two through trains each way every day over its whole line of five hundred miles, and that these trains are more heavily crowded with passengers than the trains on the New York Central were a few years ago, and larger than any regular trains we have ever seen in New England.

The Central Branch road, one hundred miles west of Atchison, and one hundred and twenty-two miles out from Leavenworth, is doing four times as much business as it did a year ago, although it has, unhappily, come to the dead halt.

The Northern Tier road is in operation thirty-six miles, to Hiawatha, and is graded to Nemaha county. Its progress has not been rapid, but it is now in the hands of energetic men and is doing well. Its business is already very large.

The road from White Cloud here is nearly all graded, and Sol. Miller expects to visit Baxter Springs before the first of January by traveling due south over a road built along the entire eastern boundary of Kansas.

Mr. Joy has pushed the Gulf road with the vigor for which he is famous, and we presume that before these lines are printed, that road has reached the Indian Territory, so that we could take a car at Leavenworth today and travel due south to the land of Quapaws.

Going west, the next road we come to is the Leavenworth, Lawrence & Galveston. We came over it on Thursday. The cars are running to Garnett, and the grading is nearly all completed to Humboldt. Gangs of men are at work along the whole route and Humboldt will certainly have this new connection by the Fourth of July. Then we can go down to Humboldt and return within twenty-four hours, and Leavenworth morning papers will reach that part of the Neosho before sunset on the day of publication.

Going west from Lawrence thirty miles farther we come to the road from Topeka to Burlingame, which has recently been at a stand still. A large amount of iron has just arrived, and Emporia is now confident that this road will reach her city within a few weeks. The distance is only forty miles, and the hope of Emporia does not seem extravagant.

East and west roads are projected from nearly every town on the Gulf road to corresponding points on the Galveston and Neosho Valley roads. The Olathe & Lawrence, and the Olathe & Ottawa roads seem to be at present ahead of all the other cross roads, but Paola and Fort Scott are sure of securing western outlets and inlets at no distant day. There is hardly a county now in Eastern Kansas, north or south, destitute of a railroad, and some are badly mutilated.

But we are traveling West, and at Junction City we meet the beginning of a trail which will never get cold while Bob. Stevens is alive. Junction city is at present the northern terminus of the Missouri, Kansas & Texas Railway—a road recently known as the "Union Pacific Railway, Southern Branch," and popularly called, in Kansas, the "Neosho Valley Railroad." This road is not yet a year old, and it already has ambitions extending in the direction of Fort Kearney, in the Northwest, Denver in the West; Fort Gibson, in the Indian country, Preston, in Texas, and St. Louis, in Missouri. Junction City, at the mouth of the Republican, and the head-waters of the Neosho, at the swelling of the Smoky into the Kaw, is the pivot of this railroad system, the central sun of this iron universe; and Robert S. Stevens is the General Manager of the new railway projects which have their starting point at Junction City and Fort Riley, the geographical centre of the United States.

The cars first reached Humboldt from Junction City about two weeks ago; the distance is one hundred and twenty-two miles, but some fifteen miles more of road is already done, and the track is going down at the rate of two miles a day. Humboldt is forty-five miles west from Fort Scott and the boundary of Missouri, and forty-five miles north of the Indian Territory; and the Neosho Valley road may get to the southern boundary of Kansas before this week is out.

The stations on the line of this road are Junction City, Skiddy, 18 miles, Parker's, 25, Council grove, 37, Big John, 41, Rock Creek, 43, Americus, 52, Emporia, 61, Neosho Rapids, 69, Hartford, 74, Ottumwa, 82, Burlington, 89, LeRoy, 103, Neosho Falls, 107, and Humboldt, 122.

* * * * * *

Fort Gibson is due south of Humboldt one hundred and fifty miles, and Galveston Bay, on the Gulf of Mexico, five hundred and fifty miles—Humboldt being in the latitude of Richmoud, Virginia. How soon Kansas is to taste salt water we do not know, but we think within less than two years, and we shall then get our fresh fish from the South, instead of New York, unless our Texas friends are too lazy to catch them.—*Leavenworth Times and Conservative.*

THE RAILROADS OF NEW YORK.

The following table given in the annual report of the New York State Engineer shows the capital stock, cost of road and equipment, amount of funded and floating debt, length of line, miles traveled by passengers, tons of freight carried a mile, earnings and expenses of twenty-five leading railroads of New York, as reported September 30, 1869:

NAME OF ROAD.	Capital stock paid in	Cost of road and equipment.	Total amount of Funded Debt.	Total amount of Floating Debt.	Length of road.	Number of miles traveled by passengers.	Total movement of freight or tons carried one mile.	EARNINGS. From freight.	From passengers.	Total Earnings.	Transportation Expenses.	EXPENSES. Payments for Interest.	Payments for Dividends.
Adirondack Company	$4,158,000	$2,783,000	$1,150,000	$194,522	37.00	298,735	954,306	$21,743	$11,418	$33,161	$15,000	$1,400	$8,175
Albany & Susquehanna	2,149,300	2,149,300	1,175,000	194,522	142.00	9,214,589	7,689,588	356,848	250,345	607,493	145,673	70,000	400,000
Albany & West-stockbridge	1,000,000	1,000,000	200,000	.....	38.00	3,918,550	31,751,145	Leased to and operated by A & B Railroad Co. of Mass.				253,500	
Albany, Genesee & Mount Morris	19,250	217,344	.....	.....	15.50	496,333	44,900						
Buffalo, Corry & Pittsburg	438,717	1,446,967	274,315	.....	43.20	.....	6,786,764						
Buffalo & Erie (for 11 months)	6,000,000	7,005,401	.....	69,973	88.10	25,258,163	46,354,767						
Buffalo & Washington	438,473	636,136	.....	.....	16.03	664,730	.....						
Canajoharie & Susquehanna	589,110	.....	.....	.....	31.61	987,464	3,693,693						
Elmira, Jefferson & Canandaigua	500,000	.....	.....	.....	47.00	4,598,767	14,960,767						
Elmira & Williamsport	1,000,000	.....	.....	.....	78.10	4,106,767	19,682,905						
Erie Railway	78,536,910	[illegible]	29,398,800	1,167	[illegible]	[illegible]	[illegible]						
Hudson River	16,000,000	19,919,531	4,369,230	900,000	144.00	106,608,815	817,820,190						
Long Island	3,000,000	4,624,464	1,235,040	.....	125.00	168,773,860	114,943,183						
New York Central	23,706,000	37,603,696	11,398,425	.....	559.75	206,186,610	10,134,200						
New York & Harlem	7,000,000	10,184,963	5,088,980	.....	130.75	27,065,142	474,419,726						
New York & New Haven	7,000,000	7,151,235	1,061,500	199,780	63.83	70,799,029	17,178,695						
Ogdensburg & Lake Champlain	6,750,000	5,705,217	516,800	110,000	118.00	6,943,113	6,660,534						
Oswego & Syracuse	3,149,100	1,445,986	591,000	9,500	36.40	2,414,428	30,832,350						
Rensselaer & Saratoga	490,400	5,8 4,900	1,596,000	.....	181.00	16,456,066	2,955,451						
Rome, Watertown & Ogdensburg	3,000,000	4,000,000	1,517,669	946	169.63	14,604,381	30,164,875						
Syracuse, Binghamton & New York	1,470,130	2,576,400	1,707,050	0.912	81.00	6,612,776	16,678,940						
South Side, L. I.	497,750	1,978,553	85,000	59,696	67.00	5,597,645	2,004,931						
Troy & Boston	607,111	2,596,749	1,677,000	435,000	24.91	4,638,884	4,950,807						
Utica & Black River	1,665,469	1,758,246	131,000	.....	69.10	2,990,504	1,172,870						
Utica, Chenango & Susquehanna Valley	1,883,650	1,580,221	.....	.....	96.00	2,344,178	724,763						

* From Report of 1868.
† Includes branches and roads operated by Company.
‡ Includes $1,935,024 dividends on interest certificates.
§ Earnings on portion of road in this State, 15.29 miles.
‖ Includes coupon interest.

—It is telegraphed from London that bonds of the Chicago & Danville Railroad Company are above par.

PAYMENT OF FARES ON CARS.

FROM THE REPORT OF THE MASSACHUSETTS RAILROAD COMMISSIONERS.

The Commissioners would also recommend to the railroad corporations the practice of having a ticket office at every station, with a view to the total suppression of the practice of paying fares to conductors. Some one, of necessity, must have charge of every station, if with a view only of preserving it from defacement and proper order. Those which have no regular ticket-office are now often constructed with dwelling accommodations, and let to employes of the corporations, whose families live there, while the employes themselves are elsewhere occupied on the line of the road. The Commissioners believe that the expense of employing ticket-masters in such stations could be mainly obviated by the practice of selecting females for these duties. Living at these stations, and fulfilling the lighter duties of ticket-masters, as they now do those of telegraph operator, such persons could, especially if themselves members of the families of the employes, at a very trifling expense, obviate the whole necessity of money being paid on the cars. The end in view, of course, to remove from conductors all temptation to dishonesty, which has in so many instances proved a serious cause of loss to railroads. Should this system be adopted to any extent, the Commissioners would further recommend to the roads the general adoption by them of a rule compelling the payment of the full legal advance in all cases of fares paid on the trains; unless, for some unforeseen cause, tickets cannot be purchased before entering the cars. The rigid enforcement of this rule would reduce the payments on trains to a small amount; it might prove possible to compel an account of this by a simple regulation, providing that, in all cases of payment of fares on cars, the conductor should return to the passenger a slip, on which he should write in pencil the amount of fare and forfeiture paid, on surrendering which at the station where he leaves the cars, the passenger would receive back the forfeit money. The slip, of course, would be returned to the general office of the road as a receipt of the conductor, and voucher of repayment of forfeiture by the ticket-master. If this expedient were found in practice to be cumbersome, then it would be deserving of consideration, whether it would not be judicious on the part of the corporations to adopt a rule that, where increased fares are exacted on payment in the cars, conductors should be called on to account for the regular fares out of the amount so collected. Were this practice adopted, employes could be relied upon in all cases to exact the increased fare from motives of self-interest; and, having a right to a portion of the payment, would be more likely to account for the remainder. From the moment that ticket offices are regularly provided, and the forfeiture is uniformly expected, the pernicious practice of paying in the cars, when tickets can be procured before entering them, will be broken up. The regulation requiring passengers to purchase tickets before entering the cars is unquestionably a reasonable one, to which the public should conform, and the corporation should have the power to enforce it.

As this subject is one wholly in the interest of the corporations, though very essential to a good railway system, the Commissioners confine themselves to simple suggestions, and recommend no legislation.

Progress of Minnesota Railroads.

It is a fact pretty well settled that work will be commenced upon the Northern Pacific road, the contracts for the grading and building of which are now being or have been let in New York City. These contracts will call for the building of the line from its junction with the Superior road to the western boundary of the State, a distance of two hundred miles, this season. Messrs. DeGraff and Crooks have already commenced work upon the main line of the St. Paul and Pacific road, and by the 1st of September next expect to have the road completed to Breckinridge, a distance from the present terminus of the track of some ninety-five miles. The Superior road has not suspended operations during the past winter, and is still engaged in pushing toward the lake, and early in July will have the road completed to Duluth, making some seventy miles of iron to be laid from the present terminus. The St. Paul & Sioux City road will extend its line from Crystal Lake to St. James, a distance of twenty miles, and, possibly, it may add thirty miles more to be completed this year. Under the late transfer of the Hastings & Dakota road it was stipulated that at least twenty miles of the road should be built this year, which will carry it to the Minnesota River. The Winona & St. Peter road will complete its line from Janesville through to the Minnesota River, a distance of twenty miles or over. The Southern Minnesota road will fill up the gap between Lanesboro and Ramsey, a distance of forty miles, which will give it a complete line from LaCrescent to Wells. Twenty miles of the St. Paul & Chicago road between Hastings and Red Wing is under contract and the work progressing already to be completed by the 1st of October next; and should Winona throw no further obstacle in the way, a much larger amount of road may be built on this line during the year. The Stillwater & St. Paul road, between Stillwater and White Bear Lake, a distance of twelve miles, by the terms of the legislation of the late session, has to be completed this year, and will undoubtedly be built. In addition to the above, the Southern Minnesota is building a road from Lanesboro, *via* Chatfield, Rochester, Pine Island and Cannon Falls, to St. Paul; the principal part of the grading between Lanesboro and Chatfield is already done. Work will, in all probability, be commenced also on the St. Paul & Dubuque road, which runs from a point on the State line, through Austin, Browndale and Mantorville, to St. Paul. We learn, further, that the prospects for commencing work on the road from Mankato to Wells are flattering, and, should the negotiations which are now in progress prove successful, this road will be built this year.—*St. Paul Pioneer.*

RAILROAD GAZETTE

PUBLISHED EVERY SATURDAY.

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Editorial Announcements.

Correspondence.—We cordially invite the co-operation of the Railroad Public in affording us the material for a thorough and worthy Railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Inventions.—Those who wish to make their inventions known to railroad men can have them fully described in the RAILROAD GAZETTE, *if not previously published,* FREE OF CHARGE. *They are invited to send us drawings or models and specifications. When engravings are necessary the inventor is expected to furnish his own engravings or to pay for them.*

☞ *Our Prospectus and Business Notices will be found on the last page.*

FOX AND WISCONSIN IMPROVEMENT.

The respectable array of names of State and city officials who have memorialized Congress in favor of this scheme might almost make a man, who really understood how impracticable and utterly visionary it was, doubt his own judgment in the premises. We mean nothing personal to Their Excellencies when we say that such men as have endorsed it ought to know better, and probably do know better, than to seek to make the public treasuries bleed in favor of such a shallow, bare-faced swindle as the attempt to render navigable the above brace of streams. We speak from personal observation and positive knowledge when we say that the Wisconsin river cannot be made navigable, in any true sense of the word, by any outlay short of that required to build a canal for as many miles as it is proposed to navigate the river. There are but three or four weeks in the year when steamboats can navigate it at all; and so changeable are the channels that, when the water *is* high enough, by no prior knowledge of the river on the part of the pilot can he avoid running aground. Between low water and shifting channels, navigation, on the part of the smallest steamers, has been a losing business heretofore, and in consequence of the annual diminution of water, is now given up altogether.

The Fox river at Portage is a rivulet capable only of carrying the very smallest craft that float. By spending enough money on it, it *can* be made navigable; but a straight canal to Lake Winnebago would be far cheaper of construction and operation than the improvement of a sinuous water course of twice the necessary length.

The swindle—we restrain our feelings—is an old one, dating back to Territorial Ouisconsin, and remembered by many as the scheme which gave birth to the thriving city of Portage, where the canal, which has doubtless been an ornament ever since,—having never been of the least possible use,—was built about the year 1852. It has been dredged and nursed at times ever since, and the company that built it drew some millions more than they ever expended upon it. The schemers who now engineer it were sharp enough to wait till grain was low, when they could reckon upon the readiness of the rural districts to endorse the faintest hope of an outlet independent of railroads. They have chosen a good season, but too transparent a pretext.

One word more. The most casual observer of the map of Wisconsin will see that the best paying lines of road run from northwest to southeast, or from west to east, but that there is no road—except the Western Union, a non-paying one—from southwest to northeast. The fact is there is no need of such a line of transportation, or a railroad would have been built upon it long ago. If simple water communication between the Mississippi and the Lakes were wanted, a good one already exists on the Illinois & Michigan Canal. Many an enterprise has been undertaken with motives as unworthy, but none that we know of with so little claim to plausibility.

THE TRANSPORTATION CONVENTION.

We published last week the resolutions of a convention held in Bloomington lately on the subject of transportation, and also a letter addressed to that convention by Governor Palmer of this State. The resolutions are chiefly devoted to the assertion of certain general principles, or rather to the denial of certain powers to railroad corporations, and the only measure of relief recommended for the evils complained of is the encouragement of certain canal schemes. Its most sensible action, however, was the appointment of a Commissioner to collect statistics concerning the business of transportation, information concerning the remedies available for burdensome railroad charges. We heartily commend any action which will enable the public to understand the business of transportation. Nearly all the wild and foolish schemes proposed which would have occasional incalculable injury to the community as well as to the railroad companies if they had ever gone into effect, have had their origin in ignorance and misconception. Let us hope that the convention's statistician will do his work thoroughly and impartially. It is altogether proper that the people should understand the extent and the limits of the powers of companies engaged in transportation, and also, so far as possible, the general principles involved in that exceedingly complex business. If they once gain such a knowledge it is hardly probable that they will venture to ask for wild "regulating" laws.

Governor Palmer offers a plan for relief similar to that of the "National Cheap Freight League." He would open the railroads to all transportation companies so as to permit any one to run trains on their lines who will pay regular tolls and submit to necessary regulations. He says that "there is no necessary connection between the ownership and management of a railway and the business of a common carrier," and claims that "the General Assembly can authorize individuals or associations "to place machinery and cars upon the railroads of the "State upon the payment of such compensation as may "be fixed by the proper tribunal." The object in view is to cause competition by making many distinct bidders for the business of a line, instead of one alone.

It would not be difficult to show the disadvantages and especially the want of economy of such a plan. It would cause complications which would render it very difficult to run trains regularly at all, and the cost would be much greater, as in other branches of business it costs much more proportionately to do work on a small scale and with a small force. But what we particularly desire to call attention to is the probability that competition, if established in this way, would not last long. To say nothing of combinations of small carriers, which would be easy and probable, the companies with large capital and abundant rolling stock would have such advantages for doing the business cheaply that they would probably soon drive their weaker competitors from the field, and then be at liberty to make rates to suit themselves.

We believe it to be unquestionably true that a corporation which has *all* the business of a railroad can do it more cheaply than two or three, or a hundred corporations or individuals. Hence any regulation tending to divide the business, even if effectual, will be a step backwards—increasing the *cost* of transportation. Competition in many cases is impossible, and a remedy for any unreasonable or extortionate charges must be sought in some other way.

An Apology.

We beg to apologize for an omission of credit in the articles in the last number of THE RAILROAD GAZETTE entitled "Operating Expenses of English Railroads," and "Railways of the Future." Both of these were taken from the London *Railway News*, and the neglect to append the name of that paper to the articles was altogether accidental.

ENGINEERING ON THE UNION PACIFIC.

We are indebted to Gen. G. M. Dodge, until recently Chief Engineer of the Union Pacific Railroad, for a copy of his report on the operations of the engineering corps of that road during the year 1868 and the eleven months of 1869 ending November 31. These operations include "the final location of the main line from Rattlesnake "Pass to Humboldt Wells, 590 miles, thus completing the "location to a connection with the Central Pacific Rail-"road, and of a branch from Ogden to Salt Lake; the "running of a preliminary line from Bear river to Cache "valley *via* Blacksmith Fork Pass, over Wasatch Moun-"tains; the running of a preliminary line from Salt "Lake to Humboldt Wells, north and south of the lake, "and the thorough development of the Salt Lake valley "east of the Humboldt Mountains, and the running of a "preliminary line from Monument Point—north end of "lake—to Portland, Oregon."

The original orders to General Dodge required that he should complete the location of the line to Green river by June 1, 1868, to the Salt Lake valley by the next fall and west of Salt Lake before the next winter. To do this James A. Evans was made Division Engineer with four parties under his directions in charge of the section tween Laramie and Green River, and J. Blickensderfer, Jr., Division Engineer, was given three parties to do the work between Green River and Salt Lake. These forces completed their work within the time required; but it seems that it was afterwards determined to commence work all along the line in the latter part of May, thus giving much less time than was needed to study the route and locate it wisely. General Dodge says: "The forcing "of the parties forward so fast and over so difficult a "country gave us no time to review our lines and no "time to re-examine or re-run them on the ground." He adds: "I state these facts so minutely that the company "may fully understand that if any complaints were made "on account of want of line—which, fortunately, has oc-"curred only to a limited extent,—the blame may rest "with the company and not with the locating engineers; "for, to my own personal knowledge, no time was lost "by any party. They worked day and night, even to "the full seven days of the week."

A preliminary survey in 1867 had determined the general route between Laramie and Green River. Mr. Evans had a party of miners organized to test the coal on this line. On this line the water is alkaline. The location of it was very successfully accomplished.

Considerable space is given to a comparison of the routes north and south of Salt Lake, the former being preferred because it was shorter by more than seventy-five miles, cheaper by about two and a half millions, and with lighter grades and fewer curves.

Perhaps the most remarkable part of this report is the expression of favor which General Dodge makes for an outlet to the Pacific at Portland and Puget's Sound from Green river. He says: "From the date of my first ex-"amination for the Pacific railroad in 1853, each year's "development has convinced me that the true route to "the Pacific Ocean was, after reaching the valley of "Green river, by way of Ham's Fork, Bear, Snake and "Columbia river, to Portland and Puget Sound." At his instance a survey of a route was ordered by the company and made by Colonel Hudnutt from Monument Point, on the north side of Salt Lake, to the Columbia river at the mouth of the Umatilla, a distance of 588 miles. The distance from the Missouri river to this point is 1,698 miles. From Omaha to Portland the distance is 1,833 miles, which is a little less than the distance by the present route between Omaha and San Francisco. A line from Granger's, the station on the Union Pacific at the mouth of Ham's Fork, is 133 miles shorter, and this makes the distance from Omaha to Portland but 1,700 miles. Of the latter, General Dodge says: "By building this "branch up Ham's Fork, crossing the rim of the basin "at Hodges Pass, running down Bear river, and again "crossing the rim of the basin through Point Neuf Gap, "crossing Snake river, and striking directly across the "plain to King's Hill Mountain, which would take you "south of the trap rock plain into a country of water, "grass and timber, and intersecting Colonel Hodnutt's "line at King's Hill, or in that vicinity, we would have "a line across the Continent that I undertake to say can "never be approached in grades, alignment, or cost, by "any other route. The heavy grades, excessive curva-"ture, expensive work, and deep snows of the Wasatch "and Sierra Nevada would be entirely avoided."

Another route noticed as feasible and preferable to that of the Central Pacific is one on the above line as far as King's Hill, thence west up the Malheur, reaching the Sierra Nevada at Goose Lake and crossing through Beckwith Pass into California.

The report calls attention to one fact which has been generally neglected, and that is that a very large part of

the road runs through an almost rainless region, and consequently has little or nothing to fear from the washing of road bed or the flooding of other works. This makes it possible to keep the road in good condition with a very light expenditure for ballasting and repairs,

Great improvements are reported to have been made since the opening of the road in bridges, ballasting. building permanent in the place of temporary tracks, widening banks, sloping cuts, etc. It is reported that all grades can be reduced to sixty feet per mile, except over the three mountain ranges, and there are some places where the curvature may be reduced.

The immediate construction of the Missouri river bridge is urged, and the company is urged to take charge of the transfer at that point, which it has just done. The report says; "The Union Pacific Railroad by law "has its terminus on the east bank of the Missouri "river, and its charter has been so drawn as to give it all "the rights and privileges necessary to do this transfer "by itself, or an agent, or by contract. No other road "has any such right, and all are subject to taxation, "legislation, and local restraint in any transfer that they "they may make."

The surveys for the route covered a belt of 200 miles, extending from the Missouri to the California line. In them more than 25,000 miles of reconnoisances were made, and about 15,000 miles of instrumental lines were run.

The surveys were made in the face of opposition from hostile Indians, and several of the engineers were killed.

Forty miles of track were laid in 1865, 260 in 1866, 240 in 1867, and in 1868 and that part of 1869 before May 10, 555 miles, exclusive of 160 miles of side and temporary tracks.

Of the work, as a whole, the Chief Engineer says, finally, that "the company need fear no fair, impartial criticism of it, or no examination made by men of ability and integrity, or such as are masters of the profession."

The report is illustrated by a very large and minute map, and it forms a valuable contribution to the science of geography, as well as to the history of this great engineering work of the age and the country.

EXPERIMENTAL TEST OF BAR IRON.

Mr. William H. Shock, C. E., U. S. N., was lately called upon to examine and test some samples of rolled bar iron furnished to the Government, under contract.

In the lot submitted there was a sample cut from a four (4) inch bar, from which twenty-eight (28) specimens were prepared. As was to be expected, No. 4 series gave the highest results, having been re-worked on the anvil.

These experiments develop the absence of homogeneousness in rolled bars and imperfect welding, as shown by some of the experiments in No. 4 series. The average tensile strength of the iron may be considered good, nevertheless:

Diameter in inches.	Area in sq're inches.	Breaking weight in pounds.	Mean Tensile strength in pounds.	Av. break'g weight in pounds.
SPECIMENS CUT FROM CENTRE OF SAMPLE BAR.				
.805	.5089	24,250	47651.7	59294.5 No. 1.
.805	.5089	34,800	68389.7	
.805	.5089	30,550	60031.4	
.805	.5089	31,100	61119.2	
SPECIMENS CUT FROM SIDES OF SAMPLE BAR.				
.800	.5026	27,525	54765.2	59087.2 No. 2.
.805	.5089	31,0 0	60915.5	
.810	.5153	31,6*0	61420.5	
.805	.5089	23,150	59245.4	
.800	.5026	30,250	60187 0	
.805	.5089	29.850	58655.9	
.805	.5089	28,000	55020.6	
.806	.5089	31,000	62487.7	
SPECIMENS CUT ACROSS SAMPLE BAR.				
.805	.5089	20,000	39300.4	53163.0 No. 3.
1.407	1.4997	16,000	11349.9	
.805	.5089	19,175	37679.4	
.805	.5089	17,375	34242.2	
.810	.5153	21,000	40752.9	
1.412	1.5681	17,000	10-34.1	
.810	.5153	20,650	40073.7	
.810	.5153	20,000	38812.3	
SPECIMENS FORGED FROM SAMPLE BAR.				
.805	.5089	30,750	60424.4	63563.3 No. 4.
.795	.4963	32,200	64880.0	
.805	.5089	26,275	61630.9	
.810	.5153	32,300	62681 9	
.810	.5153	31,650	61226 4	
.810	.5153	29.000	56277.8	
.810	.5153	33,350	64525.5	
.810	.5153	32,400	62875 9	

—*Journal of the Franklin Institute.*

PROGRESS OF RAILROADS.

Thirty years ago, which is as late as 1840, if any one could have forseen the progress and results of railroads in this country, the scene would have been to human eyes miraculous. It would have seemed impossible, not to make the roads, but to have expended such vast sums of money—to have done such a prodigious work, and to have reached such results.

We think the national debt enormous, and many persons even think we can not pay it; but we have paid as much as the national debt—in twenty years, in one branch of industry, and that not as an end, but as a means—in merely furnishing facilities for transportation. In the nature of things, this must have been so, for we inhabit a vast continent, full of wonderful resources, and the very first problem was, how to get at those resources and how to transport its products. This was a physical problem involving no moral or intellectual grandeur; but it did involve an amount of industry, and a production of wealth which is really wonderful to look upon.

A railroad is a mere machine; but it is the greatest and most costly machine on earth, which has called forth successfully all the energies of men. This country was the proper theater for its exhibition on a grand scale, and the results are marvelous.

The following is the progress of railroads from 1850 to the present time:

	1850.	1860.	1870.
Miles of Road	8,588	30,598	42,000
Cost of Roads	$296,260 128	$1,134,452,909	$2,000,000,000

For 1870, this is, in some degree, an estimate, but based on well known facts, and is not too high. The progress of this work has followed the necessities of the country. Beginning in the commercial ports on short lines, it proceeded to the great agricultural States of the Central West—then to the lines connecting the Mississippi with the Atlantic, and lastly to the great line across the continent, soon to be followed, we hope, with others to the north and south of that line, connecting the lakes and the Ohio with the great ports of the Pacific. The largest proportion of railroads is in the great agricultural States of the Central West, Ohio, Indiana and Illinois, and here is precisely where they are mostly useful, as we shall show hereafter.

It will be interesting to note some of the results of railroads, compared with the theories formed of them in the beginning:

1. The great virtue, power and grand results of railroads depend wholly upon one principle, the expansive power of steam. It did not consist in rails, for *rail*-roads, literally had been made two hundred years before in England. It was steam which made the rails valuable. It was not merely steam, it was the expansive power of steam. Why not send a locomotive by electro-magnetic power? It has been tried and succeeded in small power, but electro-magnetism wants the expansive power of of steam, and therefore, to raise high powers, is too expensive.

2. But, granting the immense power of steam applied to a locomotive, what could a locomotive do on a rail? Here the engineers and the public were at fault in the beginning. Knowing the force of cohesion, and therefore of friction, the engineers decided, in 1825, that railroads can only be used for passengers and light goods. What has been the actual result? Why, that railroads are used for heavy freight! The truth is, we have come back to the first principle. The expansive power of steam overcomes friction and all other impediments. It was thought at first that if a car went at the rate of 30 miles an hour it must meet with an immense obstruction in the column of air displaced; but apparently this obstruction is nothing. The passenger who puts his hand out of the window perceives a strong wind, but that appears to have no influence at all on the train.

3. The engineers decided, that for the same cause—friction and gravitation—the locomotive could not take a train over grades above 50 feet to a mile. This opinion was so prevalent, that when in 1836, surveys were made for the Charleston road, the engineers decided that the road to Lexington could not go direct by Ridge route, because it would require a grade of from 50 to 60 feet, and therefore, the road must go up the Licking Valley, which the Central Kentucky does, and loses 20 miles between Cincinnati and Lexington. Soon after that time, however, it was demonstrated, that loaded trains could go over grades of 200 feet per mile; of course this was not desirable, or profitable. After that the Baltimore & Ohio Railroad was made with 19 miles, on a grade of 120 feet. So ended the obstructive theory of grades.

4. If these errors of theory were in favor of the railroad system (and they certainly were) another error was by no means in the same direction. The cost of railroads was, until within the last ten years, always assumed at too low a rate. Up to 1860, the average cost of a railroad was always taken to be about $25,000 or $30,000 per mile. Indeed, the latter was assumed to be a very extravagant estimate. But by referring to the above table it will be seen, that in 1850 the average cost of railroads per mile was $37,000, and in 1860 about the same. But if the table for 1870 be correct, railroads have cost $50,000 per mile, and there is no doubt whatever, that the roads which may be regarded as finished have really cost $50,000 per mile. The fact is, that railroads are put in operation long before they are finished. More locomotives, more cars, more sidings, more depots are constantly demanded. Hence, for ten years after a railroad is put in operation, its capital, its real cost is constantly increasing. The road may be profitable, and its managers in that case, will, probably, pay the additional cost out of the receipts. But the cost is not less real, and not less to be considered as the actual cost of the road.

5. There was another curious result of railroads which was not contemplated in the beginning. The making of railroads was urged by cities and towns, originally with an idea that the benefit of railroads occurred chiefly to them. In one sense this was true. Railroads were absolutely necessary to the towns, in order that they might continue marts of trade, by bringing the products of the country to them. For example, flour, beef, pork, butter, etc., instead of falling in price, as many supposed they would, actually rose. If flour was $5 per barrel it rose to $10. If beef was 10 cents per pound it rose to 20. The railroad had no effect whatever in cheapening the necessaries of life, but the contrary. The singular phenomenon was produced, that the whole rise in price enured to the benefit of the farmer. The result of this has been that the whole cost of railroads in the United States has been paid back in the increased value of lands. Although something of this was foreseen, yet it was supposed that the difference in prices produced by railroads would be divided between the citizens of town and the farmer. But it has not been so. So far as the increase of prices is concerned, the whole of it has enured to the farmer. And we assert, without fear of contradiction, that there is no section of the country where the farm lands on the route of a proposed road would not be increased in value, by paying the whole cost of the road.—*The Railroad Record.*

REGISTER OF EARNINGS.

FOR THE SECOND WEEK OF APRIL.

St. Louis & Iron Mountain (210 miles) 1870	$27,078 15
" " (119 miles) 1869	15,332 45
Increase (43½ per cent.)	$11.745 70
Chicago, Rock Island & Pacific (608 miles) 1870	$101,300
" " (520 miles) 1869	85,427
Increase (15¾ per cent.)	$15,773

FOR THE THIRD WEEK OF APRIL.

Chicago & Alton, (431 miles) 1870	$88,546 51
" " (431 miles) 1869	83,872 14
Increase (5½ per cent.)	$4,674 37
Michigan Central, (329 miles) 1869	$90,888 82
" " (329 ") 1870	83,883 18
Decrease (8¼ per cent.)	$7,305 64
Chicago & Northwestern, (1,157 miles) 1869	$244 417 16
" " (1,157 ") 1870	214,296 89
Decrease (12½ per cent.)	$30,120 27

Suits for Railway Damages.

The courts in the United States are gradually growing more severe and rigid in holding railway companies responsible for damages for accidents to passengers. In fact some of the recent rulings and verdicts approach in severity those which have marked the English practice. At Baltimore, in the Superior Court, April 14, a verdict for $30,000 damages was given for Asher Levy, for Injuries sustained on the Baltimore & Ohio Railway; also for compensation for the loss of a wallet containing $7,700. Heavy verdicts have likewise been given, during the past year, against Hudson River, the New York Central and other companies, some of these verdicts being so out of proportion to the probable damage, that they seem to be an exposition merely of the ill-will cherished by the members of the juries against the railway companies. We say these verdicts *seem* to be unduly large, but they may not have been, because no one without closely listening to the trials can form an accurate judgment of the damage done, or the amount of willfulness or neglect of the agents or employes of the companies. These verdicts, however, may be taken as an indication that the people intend to hold the railway companies to a pretty strict rule, so far as the safety of railway travel is concerned, and we do not know that there is any objection to this; in fact the severity may be of advantage to the companies themselves. When the managers come to know that the use of unsafe materials, like cheap rails, wheels and axles, or the neglect of strict discipline, or the neglect of using ordinary devices for safe operation, will be attended with heavy cost if the damages therefrom are submitted to a jury, they will not be liable so permit either of these. We passed over a portion of a line of railway, a short time since, on foot, where we saw a succession of unsafe joints, decayed cross-ties, battered rails, and other evidence of criminal neglect that, should an accident happen there, any jury would be justified in returning a verdict of the most exemplary character, and any grand jury would be justified in finding a true bill for manslaughter at least, against the manager of the road. Where this disposition exists to trifle with the safety of railroad travel, there ought to be some power independent of railway managers to prevent it. The English Board of Trade have the power to stop the running of trains on any line of road that, in the judgment of their agents or officers, is in an unsafe condition; and so it should be in every State. Our different Boards of Railway Commissioners should have plenary powers in all cases where the safety of the traveling public is concerned, and the neglect of any manager or agent of a railway to take all reasonable means to secure safety should be promptly punished by fine or imprisonment. Safety in operation is eventual economy, and in holding managers to a strict rule, we are in fact subserving economy in operation. While our laws do not sufficiently hold managers, agents and employees to a strict personal responsibility for the results of their wilfulness or neglect, they do however hold the companies pecuniarily responsible for damages, and perhaps a strict enforcement of these laws may do no harm, even if the verdicts of the juries do, at times, appear unreasonably large. A vast advance in safety has been secured on most of the railways during the past few years, as a few facts in another column, taken from different State reports, will show. There is no method of travel that is so safe as the railway. The railways of Massachusetts carried in 1869 over twenty-seven millions of passengers, and yet not a single passenger was killed from any fault of the management. This proves that the railway may be managed with safety to the public; and proves, likewise, that the public so believe; and when a case comes before a jury, where carelessness is proved, and the jury deals with the offending party in no very merciful spirit. A great majority of the leading men engaged in railway management and operation are of more than ordinary intelligence, and this, backed up by the desire to do their duty conscientiously, is the secret of the extraordinary safe results of railway travel. The law should punish rigorously those who from willfulness or carelessness endanger the safety of the public, and that we suppose is the belief of the juries that bring in such heavy verdicts of late.—*American Railway Times, April 23.*

Chicago Railroad News.

Pittsburgh, Fort Wayne & Chicago.

We can only give the times of leaving Chicago according to the new arrangement which goes into effect next Sunday (May 1.)

The mail train will leave at 7:00 a. m., and this will do most of the local business, the other trains making comparatively few stops.

A fast train is put on which will leave Chicago at 11 a. m. and reach New York in the afternoon of the next day about six o'clock—the time is not known exactly as we write. The time will be about 30 hours. This whole train, passenger cars and baggage car, will run through to New York without change. Cars on this train will go both by Allentown and by Mantua Junction.

The Pacific express will leave at 5:15 p. m., with elegant palace cars running through to New York in about the present time.

The night express will leave at nine o'clock. It will also take palace cars through to New York.

Thus this route offers the traveler a through car on each of the three trains. Unusual efforts have been made to render the cars attractive, and the line expects its full share of the business.

Lake Shore & Michigan Southern.

We give here the time table as it will go into effect to-morrow :

The mail train will leave the La Salle street depot at 7:30 a. m., instead of 6:00, as heretofore, and will reach Toledo at 6:20 p. m., instead of 4:40. This train stops at all stations, and connects with the Kalamazoo Division.

The special New York express becomes the fast train of the line. It will leave at 11:00 o'clock a. m., arrive at Cleveland at 10:30 p. m., Buffalo at 4:10 a. m., and New York at 6:55 p. m., which is six o'clock by Chicago time. Thus the journey to New York will be made in just thirty-one hours! A sleeping coach attached to the train runs through to Rochester without change. This is one of the company's own line, and is unexcelled in beauty and comfort.

The Atlantic express will leave at 5:15 p. m., half an hour later than heretofore. The time to Buffalo and points east will be decreased by just about that amount, and passengers by this train will reach New York at 7:00 a. m. A sleeping coach will run through with this train from Chicago to New York.

The night express will leave as heretofore at 9 o'clock p. m., but it will reach Buffalo one hour earlier, and New York two hours earlier than by the late schedule. It reaches New York at 11 a. m.—38 hours from Chicago. This train will go by the air line instead of the old road. At Toledo it connects with magnificent drawing room cars for Buffalo.

The 7:30 a. m. and the 9 p. m. trains connect at White Pigeon with the Kalamazoo Division for Three Rivers, Kalamazoo, Allegan & Grand Rapids. Passengers by the 7:30 a. m. train reach Kalamazoo at 3:15 and Grand Rapids at 8:15 p. m. By the night train they reach Kalamazoo at 4:40 and Grand Rapids at 10 a. m.

The whole line is in magnificent condition, and equal to anything that will be required of it by this schedule, combining speed and safety.

The annual meeting of the stockholders for the election of directors will be held in Cleveland on Wednesday next, May 4, between eleven o'clock and two. The transfer books, which have been closed since April 2, will be reopened May 6, next Friday.

Michigan Central.

The spring and summer time-table goes into effect to-morrow (Sunday, May 1.)

The mail train will continue to leave at 5:00 a. m., and will stop at all stations.

A train will leave at 8 a. m., which will take out Cincinnati and Louisville cars and connect with the Chicago & Michigan Lake Shore road for St. Joseph.

A fast New York express is put on which will leave at 11:00 a. m. and reach New York at seven o'clock by New York time, or six o'clock Chicago time, in the afternoon of the next day, thus making the trip in thirty-one hours—apparently thirty-two, as it is apparently thirty in returning. This train will take a Pullman palace car to Rochester, where it will connect with a Wagner sleeping car for New York. The fast train west by this line will arrive in Chicago at four in the afternoon, which will enable passengers by that train to connect with some important trains to the West.

The Kalamazoo accommodation will continue on its old time, leaving Chicago at 4:00 p. m. One car attached to this train will run through to Louisville, and another through to St. Joseph. This train also takes the Cincinnati passengers.

The Atlantic express will leave at 5:15 p. m., instead of 4:45. A Pullman sleeping car attached to this train will run through to New York without change. A Pullman hotel car, refitted and refurnished in the most elegant manner, will also run with this train between New York and Rochester. At Rochester connection will be made with a Wagner sleeping car which runs through to Springfield, Mass., thus enabling Boston and New England passengers to avoid a change at Albany. Arrangements will soon be made to sell tickets for this sleeping car in Chicago.

The night express, which leaves as heretofore at 9 o'clock in the evening, will run much faster, and reach New York at ten o'clock in the morning of the second day—about two hours earlier than now.

The condition of the Great Western has been so much improved of late that this fast time, which is substantially that of last fall, will be made much easier and more regularly, and no difficulty is apprehended in doing it.

On the 20th inst. a meeting of the Directors of the Michigan Air Line Railroad Company was held in Niles at which resolutions were passed which indicate that the company will turn over to the Michigan Central the road-bed, now nearly finished, between Niles and Jackson. This would materially shorten the Central.

Chicago, Rock Island & Pacific.

The annual meeting of stockholders for the election of directors will be held June 1st. The transfer books were closed day before yesterday (April 28.)

E. St. John, the General Ticket Agent, has issued a circular announcing reduced rates for excursions to the Pacific coast over this and the Pacific roads. These rates are as follows, in currency, for the round trip from Chicago to San Francisco and return :

Parties of from	20	to	24	persons..... $204 00
" "	25	to	29	" 198 00
" "	30	to	34	" 192 00
" "	35	to	39	" 186 00
" "	40	to	44	" 180 00
" "	45	to	49	" 168 00
" "	50	to	100	" 156 00
Parties of 100 persons and over.....				150 00

This is a reduction of 13⅓ per cent. on the smallest party named, and more than 36 per cent. on the largest. The charge for sleeping cars will be $2.50 for one double berth from Chicago to Omaha, $8 on the Union Pacific from Omaha to Ogden, and $6 on the Central Pacific from Ogden to Sacramento or San Francisco. These tickets will be good for thirty days from the date of sale, and the time may be extended on request to sixty days, and additional time will be given between Chicago and Omaha.

Chicago, Burlington & Quincy.

Several changes in time and in trains take effect next Monday (May 1.)

There will be three Riverside and Hinsdale trains, leaving at 7:00 a. m.. 1:30 p. m., and 6:15 p. m., and arriving at 6:50 a. m., 9:00 a. m., and 5.30 p. m.

The mail and express which has left at 7:30 will leave at 7:40 a. m.

The Pacific express will leave at 10:45 instead of 10:00 a. m., the Mendota passenger, (a new train) at 4:15 p. m., the evening express at 5:00 p. m., instead of 3:30, the Aurora passenger at 5:30 p. m., and the night express at 11:30 as before.

The Aurora passenger will arrive at 8:15 a. m., the night express at 9:40 a. m., the Mendota passenger at 10:10 a. m., the Burlington passenger at 3:45 p. m., the Atlantic express at 4:15 p. m., and the Quincy passenger at 7:30 p. m.

By this arrangement nine district trains will leave and arrive on this road daily, four of which are through trains, while of the others one runs eighty-four, one thirty-eight, and three eighteen miles. We believe that no other Western railroad can make such a showing for passenger business.

A new station has been established about half-way between Naperville and Aurora and thirty-four miles from Chicago. It is called "Decorah."

This road has now a double track from Chicago to Riverside, 12¼ miles; from West Aurora to Bristol, 7⅛ miles; and from Leland to Mendota, 17½ miles;—in all 37¼ miles. It is intended to lay a second track between Bristol and Leland, twenty miles, during the present year, and this will complete a stretch of double track forty-five miles long, a part of the road which has a very heavy traffic. If the business increases for a few years to come, as it has for a few years past, a double track throughout the main lines will become a necessity.

Baggage-Masters' and Brakemen's Convention.

It is just about a year ago that a general meeting of baggagemen and brakemen was held in Cincinnati for the purpose of organizing a mutual life insurance association. Such an association was formed, and named the "United States Baggage-Masters' and Brakemen's Life Insurance Association." F. Wallington, of the Michigan Central, was chosen President; J. Glading, of the Philadelphia, Wilmington & Baltimore, Vice-President; J. G. Rodgers, of the Detroit & Milwaukee, Secretary and Treasurer; M. Lotterkous, of the Michigan Central, and G. Stimson and C. A. Topliff, of the Lake Shore & Michigan Southern, Executive Committee. The members of the association agree to pay fifty cents each to the heirs of any fellow-member who may die.

The first annual meeting of the association will be held in Crosby's Music Hall, in this city, next Thursday and Friday, May 5 and 6, beginning at 9 a. m. The headquarters and committee-rooms will be at the Adams House, opposite the Central Depot.

In his circular calling this annual meeting, the President addresses not only members of the association, but "all station and train baggage-masters and passenger train brakemen in the United States," and expresses a desire that a delegate may be present from every road in the country.

During the year since its first organization, the association has had not a single premium to pay.

Chicago & Northwestern.

In the financial intelligence of the number for April 23 of the *Commercial and Financial Chronicle*, always well informed and cautious in its statements, we find the following: "Northwestern is somewhat excited under the contest preparatory "to the election. At present the chances are understood to "favor the Rock Island interest as against the St. Paul, and "in order to avert that drift of affairs, the St. Paul party "desire to secure a classification of directors, which would "keep the present directors in office for periods ranging from "one to five years. An attempt of that sort was made this "week, which was foiled through the unexpected arrival of "an absent director."

The annual meeting of the stock and bondholders for the election of officers will be held in Chicago on Thursday, the 2d day of June, at 1 p. m. The transfer books were closed on the 27th of April (last Wednesday), and they will not be reopened till the 4th of June.

The time table will probably be changed on the 8th proximo.

The high water in the Mississippi made it necessary to ferry between Fulton and Clinton for several days this week, but it has now receded, and the crossing is made over the bridge without delay again.

The road has this week carried two regiments of soldiers, one from Washington and one from Nashville, about one thousand men in all, on their way to Sioux City.

Chicago & Alton.

The earnings for the third week of April, reported elsewhere in the "Register of Earnings," exhibit a considerable increase.

The spring and summer time-table will probably take effect on the 8th of May.

COACH AND CAR PAINTING IN LONDON.

A correspondent of *The Hub*, a very handsome little paper published in Cambridge, Mass., especially devoted to carriage-making, writes from London on the above named subject.. It will doubtless prove interesting to car builders everywhere :

"I give you a brief synopsis of the system of painting as practiced in London by two of the leading coach builders, who are manufacturers to Her Royal Highness. I visited their factories in November. As your correspondence from a Boston painter, which described the method of painting in that city, contained many points of interest to the London painter, so in return I think the variations therefrom, which are here noticed, will be worthy the attention of your Boston painters. The rapidity with which you paint a job in America is very surprising to the London painters. In London a very tedious and expensive process is employed, but great durability is thereby obtained. I don't think either party is wholly in the right. We use too much time, and you perhaps too little, but by a proper attention to both speed and durability, or a proper mean between the London and American methods, I believe that a method preferable to either may be worked out.

The London builder proceeds thus in painting the body of a fine coach :—

4 coats of lead.
7 " " rough-stuff.
1 " " lead.
putty and face.
1 coat of lead, and sand paper.
1 coat of lead, and sand paper.

14 coats before coloring.

From this point, the upper and lower panels of the body are finished, differently, namely :—

Lower panels	3	coats of color
	1	" glazing.
	4	" hard-drying varnish.
	1	" wearing body.
	9	coats, or 23 from the beginning.
Upper parts	1	coat ivory black.
	2	" black Japan.
	2	" hard-drying varnish.
	1	" wearing body.
	6	coats, or 20 from the first.

The flatting is left to the judgment of the painter and is arranged according to the finish required to suit the purchaser. Sometimes every coat is flatted, and sometimes only every other coat. To obtain perfect smoothness, a great deal of time is used in rubbing. Another process that is employed for jobs that are less nice is as follows:

2 coats lead (priming.)
5 " rough stuff, and rub.
1 " lead (facing) and rub.
1 " ivory black.
2 " black Japan.
rub one or both, at discretion.
1 " flatting varnish.
1 " wearing body.

13 coats in all.

When the body is not to be black, two or three coats of the required color take the place of the two coats of black Japan, and an additional coat of flatting varnish is used. All the color coats and rough stuffs are mixed with Japan gold size.

In the large railway shops, which I visited about the same time that I visited the coach factories mentioned above, I found that more attention was paid by them to durability and preservation of the paint than to the perfect smoothness of the job. The last color coat is generally mixed with part varnish, over which one coat of hard-drying varnish is flatted, and the job is finished with three or four coats of best wearing body. The latter is applied, a coat every other day, and sometimes a coat every day. To do this each coat has to be flatted with superfine pumice and cold water, just enough to allow the following coat to lay.

—The Cincinnati Board of Trade has adopted resolutions declaring against the scheme discovered to place the management of the Louisville Canal under the control of a corporation to manage it for its own benefit, and urging Representatives in Congress to oppose the measure and support the report of the sub-Committee on Commerce in the House of Representatives, to appropriate $250,000, that the canal should be completed and made free to all.

PUBLISHER'S ANNOUNCEMENTS.

Railroad Tickets.

General Ticket Agents who may wish to know where they can procure consecutively numbered tickets are referred to the establishment of Rand, McNally & Co., at No. 51 Clark street, Chicago, where they can obtain them of any style and in any quantity on short notice. It is hardly necessary to call the attention of the agents of the older roads to this establishment, for they all know it; but it is reasonable to suppose that agents of the scores of new roads will be glad to know what facilities there are in the West for obtaining this indispensable part of their stock.

The ticket department of this house is under the immediate supervision of Mr. John Reid, a gentleman of large knowledge in railroad ticket matters, as well as ten years' practical experience in the practical working of ticket machinery.

At this place consecutively unmbered tickets of every variety are printed with a rapidity, accuracyand neatness which are truly astonishing to one who has not witnessed the operation.

Most of their consecutively numbering printing presses were built under their own supervision with many improvements, which, they claim, make them superior to any others in the country.

Rand, McNally & Co., also manufacture a great variety of ticket cases, dating presses, cancelling stamps, conductor's punches, eyeleting machines, and, in short, almost every article needed in the general passenger and ticket department of a railroad. The ticket cases and dating presses have valuable improvements on those commonly in use, and are especially recommended.

The firm now supplies immense quantities of tickets to our Western companies, and has, we have reason to know, given great satisfaction.

Michigan Car Company.

The shops of this company, located on the corner of Larned and Fourth streets in Detroit, have received extensive additions during the past year. During the present year new machinery and additional facilities have been introduced for doing their work rapidly and well. They make a specialty of building platform, coal, box and cattle cars, and since January, 1869, have supplied these cars to the Union Pacific, Detroit & Milwaukee, Great Western of Canada, New York Central, South Pacific of Missouri, and a number of other companies in the Western States.

The company keep on hand a large quantity of seasoned lumber, make their own wheels and castings and connect with the Michigan Central Railroad yard so as to be able to build and ship eight cars per day.

What is Said of the Railroad Gazette.

"A well-edited paper, showing industry and intelligence."—*American Railway Times.*

"Makes a very handsome appearance and is full of valuable matter."—*Chicago Evening Post.*

"For railroad men and others wishing to keep themselves thoroughly posted on railroad matters we know of no better paper."—*Madison State Journal.*

"The best informed railway newspaper published in the West."—*Aurora (Ill.) Beacon.*

"In its financial and commercial views in connection with the railroad interests of the country, may be regarded as one of the first papers of the United States."—*Pensacola Observer.*

"Has been for thirteen years a live, energetic railroad newspaper, and has fought its way up among its many competitors for the favor of the railroad public, gaining in strength and rising in importance year by year, until to-day it stands second to no journal of that important class in the United States."—*Peoria Daily Transcript.*

"As it devotes much attention to Southern railroad and industrial interests, it is always interesting to Southern readers."—*Galveston News.*

"Every man who is at all interested in railroads would do well to take the GAZETTE."—*Jacksonville (Ill.) Independent.*

"Unquestionably the best railroad journal in the United States.—*Waukegan (Ill.) Patriot.*

"We regard it as the best railroad paper out."—*Peoria National Democrat.*

"Promising much for the future."—*Detroit Commercial Advertiser.*

"Equal in appearance to any technical journal of America."—*Atchison Patriot.*

"Emphatically a journal of transportation, and contains every conceivable item of news on the subject of railroads, steamboats, telegraphs, express companies, etc."—*Flint (Mich) Globe.*

"A very neat publication in point of appearance, and, as it always has been, is now a reliable, interesting and accurate journal, ably edited in its various deparments. * * * Our scissors have wandered over its columns "many a time and oft," and always with gratifying results."—*Buffalo Commercial Advertiser.*

"Has always been one of the most valuable publications in the West. * * * Is bound to continue its sway as the leading railroad journal of the country."—*Sedalia (Mo.) Bazoo.*

"Has always been one of the best papers of the country for railroad intelligence."—*New York Commercial and Financial Chronicle.*

"The news is very full, the discussions are conducted in good temper and with excellent information. To judge from this first number, the conductors of the GAZETTE know what "railroading" is, and what a proper weekly journal should be."—*New York World.*

"One of our most valuable exchanges. * * * Its columns teem with reliable information of great benefit to railroad men of every section of the United States."—*Leavenworth Bulletin.*

"An excellent journal for railroad men."—*Mankato (Minn.) Record*

"An impartial and independent journal, valuable to every railroad man."—*Parkersburg (W. Va.) Times.*

"Every railroad man reads the GAZETTE."—*Bloomington (Ill.) Leader.*

"It will compare favorably with any similar publication, not only in New York or Boston, but in London or on the Continent."—*Waukegan (Ill.) Gazette.*

"The best journal of its class in the United States."—*LaCrosse Leader.*

"Well worthy the patronage of all intelligent railroad men."—*Kalamazoo Gazette.*

"Full of information, scientific and general, with regard to railroads all over the country, their construction, operation, etc."—*Rochester Chronicle.*

"Of great interest to railroad men."—*Delaware (O.) Gazette.*

"A most valuable thing to the engineer and all railway men, the capitalist, traveler, mechanic and general reader."—*Brooklyn (N. Y.) Argus.*

"Of great interest to railroad men, and almost equally so to those who use railroads."—*Marshall (Mich.) Statesman.*

"It must prove a very valuable paper to stockholders ahd those who are interested in railroads."—*New York Globe.*

"A complete repository of railroad news."—*Harrisburg (Pa.) Patriot.*

"It appears to be in many features the best journal of its class now extant."—*New York Official Railway News.*

"Replete with matters connected with railroading."—*Holmesburg (Pa.) Gazette.*

"A model of what a railroad newspaper should be."—*Chicago Tribune.*

"A publication of great value to every one interested in railroads and railroading, and its scientific articles are of great value to every scholar."—*Oshkosh (Wis.) Northwestern.*

"In every respect a worthy representative of the energetic and go ahead city where it is published."—*Cincinnati Railroad Record.*

JOHN S. NEWBERRY, President. E. C. DEAN, Treasurer and Manager.

Michigan Car Co.,

MANUFACTURERS OF

RAILROAD CARS!

200 Larned Street West,

DETROIT, - - - MICH.

JAS. McMILLAN, Sec. JAS. McGREGOR, Sup't.

L. C. BOYINGTON. H. A. RUST.

Boyington & Rust,

BRIDGE BUILDERS,

— AND —

CONTRACTORS.

Nos. 2 and 3 Andrews Building,

157 LASALLE ST., CHICAGO.

Builders of Iron, Combination and Howe Truss Bridges, Railroad and Highway Bridges, Roofs and Engine Turning Tables.

HARRISBURG

Foundry and Machine Works!

(Branch of Harrisburg Car Mfg Co.,)

Harrisburg, - - Pennsylvania.

MANUFACTURERS OF

MACHINISTS' TOOLS!

— SUCH AS —

LATHES, PLANERS, Shaping and Slotting Machines Bolt Cutting & Nut Tapping Machines, &c.

W. T. HILDRUP, *Treasurer.*

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Rolling Mill

COMPANY,

Manufacturers of and Dealers in

Railroad Iron.

OLD RAILS RE-ROLLED,

— AND —

Rails of Any Desired Pattern

Furnished promptly to order.

STEPHEN CLEMENT,.....President.
O. W. POTTER,.....Secretary and Gen. Sup't.

Office, 82 La Salle St., Chicago.

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IRON COMPANY!

OF MILWAUKEE, Wis.,

Is now prepared to Manufacture

Railroad Iron,

OF THE MOST APPROVED PATTERNS

—AND OF—

Unsurpassed Excellence!

OLD RAILS RE-ROLLED.

CAPACITY OF WORKS:

25,000 Tons of Rails per Annum.

E. B. WARD, *President.*
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City Office, No. 90 Michigan St.
General Office at the Works,
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WYANDOTTE

Rolling Mill Company,

Manufacturers of and Dealers in

Railroad Iron,

MERCHANTS' BAR,
ROUND, SQUARE, and
FLAT IRON of all Sizes.
BOILER RIVETS,
CABLE CHAINS, FISH JOINTS AND CHAIRS, Etc.

Made from the Best Charcoal Lake Superior Pig. Also a very Superior Quality of

Extra Flange Boiler Plate,

Manufactured from

No. 1 Charcoal Lake Superior Pig,

REFINED, KNOBBLED, TWICE-HEATED AND HAMMERED,

The greatest care being taken to make it fully equal to the best LOW MOOR IRON.

☞Orders solicited and executed with despatch. N. B.—All Iron manufactured at these Works, Warranted.

STORE & OFFICE Foot of Wayne St., DETROIT.

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200 Country Papers.

Terms of Advertising,

Only TWO DOLLARS per Line,

WITH A LIBERAL

Discount to Heavy Advertisers.

THIS IS BY FAR

The Cheapest Advertising

EVER OFFERED.

Parties desiring extensive Advertising in the West and Northwest, are invited to avail themselves of the unusual facilities of the undersigned for inserting advertisements in TWO HUNDRED

LEADING COUNTY PAPERS.

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AMERICAN

Hand Stamp and Patent Company.

Manufacturers, Agents and Dealers in

Hand Stamps, Notary's Seals,

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Stencil Cards, Plates,

Inked Ribbons in any Size.

Manufacturers of

Secor's Patent Pen Racks, Embossing Seals, with Changeable Date, Secor's Patent Writing and Shipping Ink in all Colors.

Secor's Repeating Lights,

IXL Draw Lights, IXL Lanterns,

Sewing Machine Castors, for all Machines,

Secor's Patent Magic Star Pad Ink, in all Colors. Also, dealers in

PORTABLE PATENTS,

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☞ Agents wanted in every city or town.

SEWER PIPE, DRAIN TILE,

Bath Brick & Fire Brick,

Manufacture and Sold by

THE JOLIET MOUND CO.,

Joliet, Will Co., Illinois.

Office & Yard in Chicago,

Corner Wells and Polk Sts.

☞ Orders and inquiries promptly attended to.

JOLIET MOUND CO.

UNION TRUST CO.,

OF NEW YORK.

No. 73 Broadway, cor. Rector St.

***Capital,* - - 1,000,000.**

[All paid in and securely invested.]

INTEREST ALLOWED ON DEPOSITS, which may be drawn at any time.

This Company is by law and by the order of the Supreme Court made a legal depository of money. It will act as Receiver in cases of litigation, take charge of, and guarantee the safe keeping of all kinds of Securities, and collect coupons and interest thereon.

It is authorized by law to accept and execute all TRUSTS of every description, in reference to both real and personal property committed to them by any person or corporation, or transferred to them by order of any of the Courts of Record, or by any Surrogate.

It is especially authorized to act as Register and Transfer agent and as Trustee for the purpose of issuing, registering or countersigning the certificates of stock, bonds or other evidences of debt of any corporation, association, municipality, State or public authority, and will pay coupons and dividends on such terms as may be agreed upon.

In giving special prominence to this department of its business, attention is particularly called to the paramount advantages of employing this COMPANY in the capacity of AGENT, TRUSTEE, RECEIVER OF TREASURER, in preference to the appointment of INDIVIDUALS. A guarantee capital of ONE MILLION DOLLARS specially invested by requirement of its charter, and a perpetual succession; a central and permanent place of business, where business can be transacted daily, without disappointment or delay: its operations directed and controlled by a responsible Board of Trustees; and its entire management also under the supervision of the Supreme Court and the Comptroller of the State.

Permanency, Constant and Responsible Supervision, Guaranteed Security and Business Convenience and Facilities, may therefore be strongly urged IN ITS FAVOR on the one hand, against the Uncertainty of Life, the Fluctuations of Business, Individual Responsibility and General Inconvenience on the other.

ISAAC H. FROTHINGHAM, President.

AUGUSTUS SCHELL, } Vice-Presidents.
HENRY K. BOGERT, }

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CHARLES T. CARLTON, Secretary.

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—AND—

GENERAL CONTRACTOR.

No. 2 S. Clark St.,

CHICAGO, - - ILLINOIS.

(Official Publication.)

ANNUAL STATEMENT

OF THE

HOME INSURANCE CO.

OF CHICAGO,

In the State of Illinois, on the 31st day of Dec., 1869, made to the Auditor of Public Accounts of the State of Illinois, pursuant to law.

CAPITAL.

Amount of Capital Stock paid up in full.....$200,000 00

ASSETS OF THE COMPANY.

Value of Real Estate owned by the Company	$ 1,000 00
Loans on Bonds and Mortgages	188,230 00
Loans on Collateral Security	25,587 53
Cash on hand and in Bank	8,071 17
Premiums in course of collection and transmission	7,621 48
Office Furniture, etc.	2,500 00
Interest accrued, and Stamps on hand	3,106 91
Total Assets	$236,117 09

LIABILITIES OF THE COMPANY.

Claims and Losses adjusted and in process of adjustment	$ 1,400 00
Amount necessary to reinsure all outstanding risks	15,167 10
All other debts of the Company,—Salaries	1,758 66
Total Liabilities	$ 18,325 76

FRED. LETZ, President.

THOMAS BUCKLEY, Secretary.

Subscribed and sworn to before me this 26th day of January, 1870. WM. H. HOLDEN, N. P.

Home Office, No. 139 Madison-st.

WALL PAPERS!

WINDOW SHADES, &c., &c.

A choice and superior stock of the finest imported WALL PAPERS and WINDOW SHADES, for sale REDUCED PRICES, at

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☞ Orders from the city or country for Paper Hanging, Calcimining, House Painting and Graining promptly attended to. The best workmen employed and satisfaction guaranteed.

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The Mercantile Agency.

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Reference Book!

For the Semi-Annual Term, commencing July 1st.

It contains the names and business of individual traders and firms throughout the States and Territories, Canada and Nova Scotia, with their

CAPITAL, CREDIT AND STANDING

In the communities where they reside, revised by their own Exclusive Agents and Correspondents, upon fresh detailed reports.

Several Thousand New Names

Have been added since the last volume, and a vast number of changes made in old quotations.

Names no longer in Business have been Dropped.

This work has been faithfully executed with labor and care at great expense, and is offered to business men with the fullest confidence in its accuracy and reliability. For every estimate and gradation of credit in each individual case a report can be found upon the

RECORDS OF THE AGENCY.

THE REFERENCE BOOK may be seen at the office in New York and the other cities, and with

Claims for Collection

Promptly attended to throughout the United States and the British Provinces.

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OFFICE:

101 & 103 Wabash Ave.,

CHICAGO, — — ILLINOIS,

ALEX. ARMSTRONG, Manager.

[Manager of the Pittsburgh Branch from 1854 to 1856.

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— TO —

Railroad Companies and Bridge Builders!

FOR SALE:

3 Howe Truss Railroad Bridges

COMPLETE.

100 ft. spans; built in best manner, and of heaviest description. Will be sold at less than cost to close out the business of Ledlie & Corse. Apply by letter or otherwise, to Room 25, ORIENTAL BUILDING, CHICAGO.

RUFUS BLANCHARD,

146 Lake St., Chicago,

Has Issued a NEW STYLE of

MAPS!

IN FLEXIBLE CASES,

Which are both cheap and convenient. The following States are now ready: Illinois, Iowa, Missouri, Kansas, Nebraska, Minnesota, Wisconsin, Indiana, Michigan and Ohio. Mailable on receipt of 25 cents. They show the counties, towns and railroads and are fine specimens of workmanship.

THE INTERIOR.

A New Religious and Family Journal.

CAPITAL STOCK.....$50,000.00

TERMS—$3.50 a year in advance. $3 after 90 days.

Advertising Rates Furnished on Application.

SEND FOR A LIST OF PREMIUMS.

Published for the Western Presbyterian Publishing Company.

ARTHUR SWAZEY, *Editor-in-Chief.*
C. VAN. SANTVOORD, D. D., *Assistant Editor.*
W. S. MILLS, Publisher.

OFFICE—Room 5, Monroe Building, corner of Clark and Monroe streets, Chicago, Ill.

The leading paper of Michigan, the Detroit *Daily Tribune*, thus speaks of THE INTERIOR:

"We have received the first number of THE INTERIOR, the new Presbyterian paper just established at Chicago, and designed to subserve the wants of that re-united denomination throughout the great and growing West and Northwest. It is a beautiful specimen of typography and tasteful make-up, and abounds in excellent matter for a religious paper, both useful and entertaining. Its Eastern cotemporaries of the same denomination will have to look well to their ways, or they will be outstripped by this new competitor."

The *Standard*, the principal organ of the Baptist Church, says of THE INTERIOR:

"It is a large, handsome, first-class paper in every respect. * * We congratulate our Presbyterian brethren of the Northwest in being represented by a peer of the best religious journals in the country."

THE BEST

FIRE PROOF SAFE

IN THE WORLD,

Is now Manufactured

IN CHICAGO,

—BY—

HERRING & CO.

40 STATE STREET.

The Best Bankers' Safe

IN THE WORLD,

Is Manufactured in Chicago by Herring & Co.

The above Bankers' Safes are lined with the Crystalized (or Franklinite) Iron—the only metal which cannot be drilled by a Burglar.

HERRING & CO., 40 State St.

Manufactory:—Corner 14th St. and Indiana Ave

WM. U. THWING,

PATTERN

—AND—

Model Maker!

Calhoun Place, Rear of No. 120 Dearborn Street, Chicago, Third Floor.

Employing none but the best workmen, and having superior facilities, I am prepared to do the best work (using the best materials) at low figures, and guarantee satisfaction. Patent Office Models a specialty.

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Manufacturing Co.,

479, 481 & 483 STATE ST., CHICAGO,

Manufacturers of

RAILWAY CAR TRIMMINGS,

AND

Removable Globe Lanterns.

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A. H. GUNN, Sec'y. J. M. A. DEW, Ass't Supt

John Blakeley,

DEALER IN

WOOL AND COTTON WASTE,

For Railroad and Steamboat Use,

Steam Packing, &c.

233 Church Street, Philadelphia, Pa.

SOLE AGENT FOR

Cleveland Steam Gauge Co.

HOLT'S PATENT STEAM GAUGES,

For Locomotive and Stationary Engines, Locomotive Spring Balances, Water Gauges and Test Pumps.

G. HUBBARD. G. B. CARPENTER

Gilbert Hubbard & Co.

SHIP CHANDLERS,

AND DEALERS IN

TWINES & CORDAGE.

205 & 207 S. Water St.,

CHICAGO.

We would call particular attention of the Trade to our stock, as we at all times have the largest and best assortment in the West, of

Cotton and Flax Duck, all Widths,

DITCHING ROPES.

MANILLA & TARRED ROPE

Bags, Bagging, Burlaps, Canvas, Oakum, Tar, Pitch, Tackle, Blocks, Chains, Coal Tar

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Wagon Covers,

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Sole Manufacturers, under our own Patents, of

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Over 20,000 Cars covered with this Roof! We claim that these Roofs will keep Cars dry, and will last as long as the Cars they cover without any extra expense after once put on.

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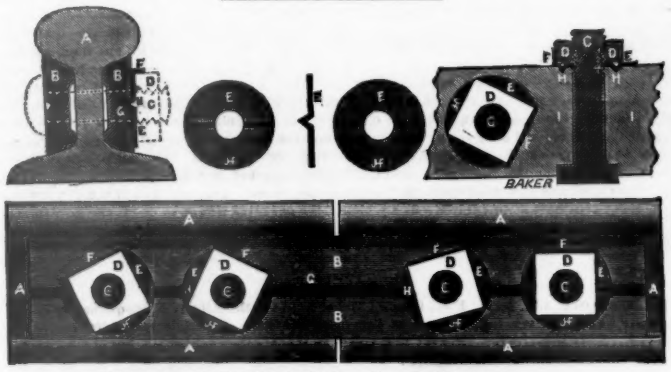

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WARMING AND VENTILATING Railroad Cars

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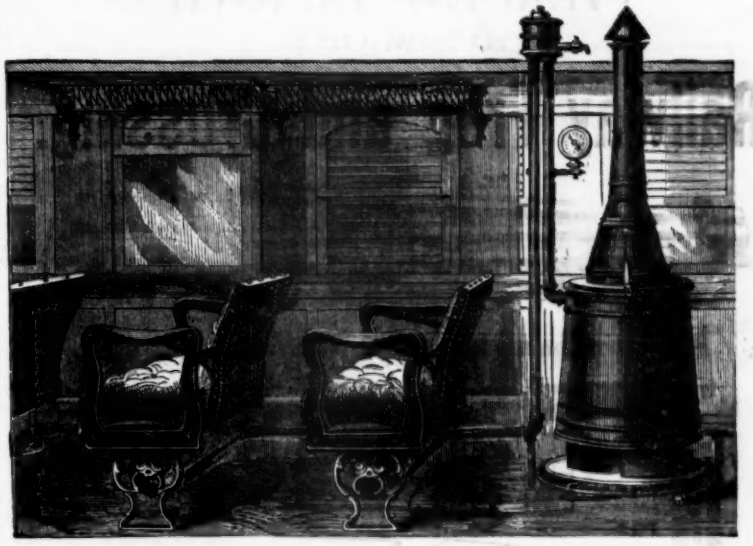

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A very simple, safe and efficient plan for

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HOT WATER PIPES,

WHICH RADIATES THE HEAT DIRECTLY AT THE FEET OF EACH PASSENGER WITHOUT THE NECESSITY OF GOING TO THE STOVE TO GET WARMED!

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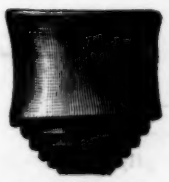

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Consult the interests of your Company, by purchasing PIERCE'S ELASTIC RENEWABLE RAILWAY FROG AND CROSSING. The cheapest, best and most durable yet introduced. Examine the cuts and specifications, for particulars. All Frogs and Crossings of this device warranted to give satisfaction. Orders promptly filled. Address as below. Specifications of

PIERCE'S ELASTIC
RENEWABLE
Railway Frog and Crossing.

FIG. 3

FIG 1

FIG. 2

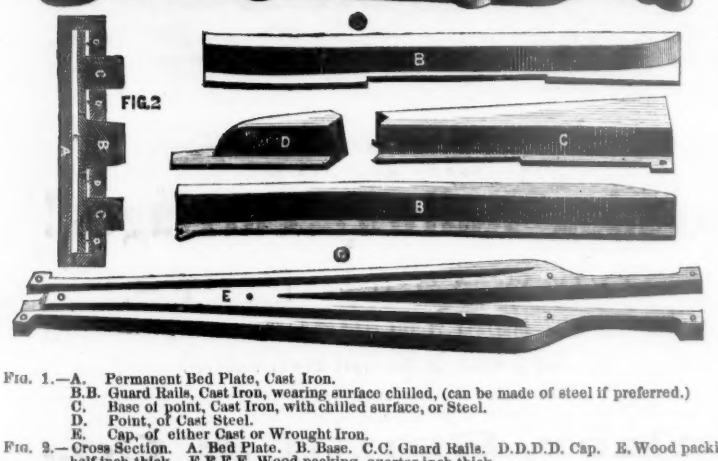

FIG. 1.—A. Permanent Bed Plate, Cast Iron.
B.B. Guard Rails, Cast Iron, wearing surface chilled, (can be made of steel if preferred.)
C. Base of point, Cast Iron, with chilled surface, or Steel.
D. Point, of Cast Steel.
E. Cap, of either Cast or Wrought Iron.

FIG. 2.—Cross Section. A. Bed Plate. B. Base. C.C. Guard Rails. D.D.D.D. Cap. E. Wood packing half-inch thick. F.F.F.F. Wood packing, quarter-inch thick.

FIG. 3.—Shows the Frog complete, with all its parts adjusted ready for laying down.

THE ADVANTAGES claimed for this Frog are in brief: FIRST—The permanency of the bed plate, on which there is no wear. SECOND—The durability of the Guard Rails, base and point, and the ease with which they can be renewed. Also, the elasticity which is given by the packing, avoiding the rigidity of the Solid Frog. THIRD—The bed plate being once in position, does not require to be taken up to produce a new Frog, as the wearing surfaces (Guard-rails, base and point) are renewable at pleasure. FOURTH—The Cap E is adjustable and easily removed for the purpose of renewing any of the worn parts, and can be done in ten minutes time by two men. The Guard-rails, point and base, being held in position and fastened by the Cap. By this device a new Frog is produced at about one-third the original cost. FIFTH—It is not necessary to take up or move the connecting rails with the Frog for the purpose of renewal. It does away with the interruption to passing trains and the labor incident to replacing the old form of Frogs. Many other points of excellence and economy might be adduced which it is not deemed necessary to enumerate, believing that a practical examination or test by Railroad Managers will bring out its qualities and prove its usefulness.

PRICE LIST.

[POINT OF CAST STEEL, BASE AND GUARD RAILS OF CHILLED IRON SURFACE.]

No. 1.—6	Foot Frog about 7	degrees,	$85.00	) Base, $8 each.
" 2.—5½	"	"	" 8	"	$85.00	(Point, $10 each.
" 3.—5	"	"	" 9	"	$82.00	) Guard Rail, $8 each, or Full Set, $30.

☞ Other sizes that may be desired, or renewable parts of Cast Steel, furnished at proportionate rates.

SHERMAN, MARSH & STEEL, Manufacturers and General Agents,
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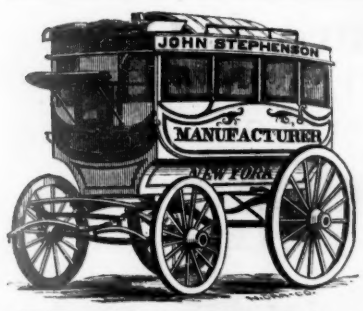

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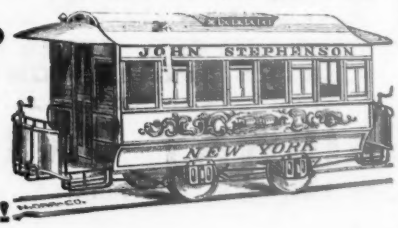
—OF—
EVERY STYLE!

☞ Orders Promptly Filled. ☜

CARS,



LIGHT, STRONG
—AND—
ELEGANT!

Important to Railway Companies!

THE following, which we take from one of our exchanges, is but an illustration of how much money railroad companies are and have been paying for the old-style baggage-check, and how easy it is for them to be daily purchasing baggage-checks, until they amount to millions ere they are aware of the fact:

"*A Rash Promise.*—A paper tells the following story of a young lady who is a pupil at one of the schools in this city, and who has already, it seems, beaten her father at mathematics. She modestly proposed that if her father would give her only one cent on one day, and double the amount on each successive day for just one month, she would pledge herself never to ask of him another cent of money as long as she lived. Pater-familias, not stopping to run over the figures in his head, and not supposing it would amount to a large sum, was glad to accept the offer at once, thinking it also a favorable opportunity to include a possible marriage dowry in the future. At the twenty-fifth day, he became greatly alarmed, lest, if he complied with his own acceptance, he might be obliged to be 'declared a bankrupt on his own petition.' But at the thirtieth day, the young girl demanded only the pretty sum of $5,368,719 12. The astonished merchant was only too happy to cancel the claim by advancing a handsome cash payment for his folly in allowing himself to give a bond—or his word he considered as good as a bond—without noticing the consideration therein expressed, and by promising to return to the old custom of advancing smaller sums daily until otherwise ordered."

In comparing the above with the cost of baggage-checks, it is well known by every baggage-man that to supply a road perfectly with checks, it is necessary that the baggage should have on it *a check which, of itself, indicates the station for which the baggage is destined*; if it has not, the baggage-check is not perfect or complete. As every intelligent person can conceive at a glance, to bring the checking of baggage to such a state of perfection with the old style of baggage-check would cost an immense amount of money, as per example: We will take the New Jersey Railroad; we will say that it has twenty stations; it will require one thousand checks from New York to Newark, one thousand from New York to Elizabeth, one thousand from New York to Rahway, one thousand from New York to New Brunswick, and so on to the whole twenty stations. Then we again commence with one thousand from Newark to all stations, one thousand from Elizabeth to all stations, and so on until all stations are supplied, then we have just commenced; as other stations are added, and other connections made, all this must be done over and over again, and there is no help for it so long as railroad companies continue to use the old-style check and system of checking baggage. The next question is, how to obviate the necessity of purchasing this immense amount of baggage-checks? Simply by adopting the Thomas Safety Baggage-Check and system of checking baggage. By its use, it matters not how many different stations are opened, or how many connections are made, the *one check will go to every one of them*, and, by so doing, save tens, if not hundreds of thousands of dollars to railroad companies, and, at the same time, obviate the necessity of purchasing checks by the million.

The following, from S. E. Mayo, Esq., General Ticket Agent of the Albany & Susquehanna Railway—a gentleman who has given the checking of baggage a most careful, practical consideration—is but one from nearly forty representatives of the best-managed roads in the country in reference to its incomparable value *both as a local and through check*:

"In reference to the Thomas Safety Railroad Baggage-Check, it has no equal; and, if I were not thoroughly convinced by personal experience, that it merits all and more than is claimed for it, I would not speak so highly in its favor. As you are aware, we have recently added a large number of new *through tickets* to our stock—with the Erie Railway, alone, some 38 different forms. With the old style of checking baggage, I should have been compelled to buy not less than 3,800 checks for those 38 stations, which is obviated by the Thomas system of checking baggage. Instead of covering the whole side of my baggage-room with 3,800 different forms of baggage-checks, I simply add 38 forms of station-cards to my collection, in a thirty-inch case, alongside of which are my brass checks for any station designated by card. Another great advantage possessed by this check over the old style, is, if we should discontinue our connection with any route, the Thomas Check is not lost or become useless, as is the case with the old style of checking baggage, but with the cards, they at once become available elsewhere. Experience daily convinces me that the Thomas Check *is the only economical, systematic and safe check in use*, and that it will not be possible much longer for its opposers to close their eyes upon its many great advantages over all other checks and systems of checking baggage, and it must ultimately commend itself to any and all who are not too prejudiced to give it a fair trial. I therefore recommend it with perfect confidence to all railroad companies as the best baggage check in use, *for both local and through travel*."

HENRY STEFFEE, Esq., G. T. A. of the Louisville, Cincinnati & Lexington Railroad, says:

G. F. THOMAS, Esq., 90, 92 and 94 Grand Street, New York:

DEAR SIR: It is with much pleasure that I am able to inform you that our baggage-men consider the Thomas Improved Safety Baggage-Check unequaled. They inform me that it facilitates the checking of baggage wonderfully, in consequence of being able to send, with any check, a piece of baggage from any station to any station, and not being compelled to spend several minutes in looking for a particular check for a certain station; by the use of your check, they save from one-half to two-thirds of the time required to check baggage by the old style of check, and with much more certainty. To stock our road as perfectly with the old style of check as we have with yours, would require, at the least calculation, full twenty times the number of checks, which, in place of simplifying, complicates the checking of baggage; your check obviates all this complexity, and so simplifies the business that it is impossible to make a mistake, unless through gross negligence or incompetency. Previous to the introduction of the Thomas Check, in consequence of the great expense, no road would even think of bringing the checking of baggage to such a state of perfection as yours does, it requiring such large quantities of brass checks to do the business *as it ought to be done*, which is the reason such a great number of railroads, even to this day, adhere to the old English style of pasting and chalking baggage. I am satisfied that, if the officers of all the railroads were as well acquainted with the superiority of your check in every respect as are the officers of those roads upon which it is in use, it would be universally adopted, *both as a local and through check*, not only on account of its accuracy, economy and certainty, but also in consequence of its unequaled advantages in facilitating and simplifying the whole baggage business.

S. SCHOCH, Esq., Superintendent of the Morris & Essex Railroad, says:

"We have used the Thomas Safety Baggage Check on our road over two years, during which time we have never lost a piece of baggage to which it was attached, but, on the contrary, the baggage in every instance arrives at its place of destination with unerring certainty. We do, therefore, without the least hesitancy, recommend its use to any railroad company, being fully satisfied, after the most thorough trial, that, for a safe, reliable railroad baggage check, it has no equal, and, were it at this time in use upon every road in the country, the checking of baggage would not only be reduced to a perfect system, but would also be the means of saving railroad companies fully one-half of the present cost of conducting the baggage business."

JAMES M. WHITE, Esq., Train Master of the Central Railroad of Georgia, says:

"We are much pleased with the Thomas Patent Safety Baggage Check. They are just the check required by railroad companies, as they can be prepared in advance, or changed in a moment, for any station, and *a very small number of brass checks does the work of many*. There is not the least doubt but that it will in time take the place of all other baggage checks now in use."

A. C. DAVIS, Esq., G. T. A. of the Belvidere, Delaware & Flemington Railroad, says:

"The Thomas Safety Baggage Check works to our entire satisfaction. No failure in the transmission of baggage since we commenced its use over two years ago. The baggage masters are pleased with them, and I am well satisfied they are the best baggage check in use, and better calculated to perform the various duties of *both local and through business* than any or all other baggage checks I have ever seen. Every check is, and has been, kept in constant use since we first commenced using them; and, so far as certainty, simplicity and economy are concerned, they have no equal."

☞ All necessary information in reference to the Thomas Patent Safety Railroad, Steamboat and Express Baggage Check will be given by addressing

G. F. THOMAS, Editor Appleton's R'y Guide,
90, 92, 94 Grand St., New York.

THE

"RED LINE!"

—RUNNING OVER THE—

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—WAS THE—

FIRST LINE to CARRY FREIGHT BETWEEN the EAST and WEST,

WITHOUT CHANGE OF CARS!

CARS RUN THROUGH TO

NEW YORK AND BOSTON,

IN FOUR AND FIVE DAYS!

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Great Central Route.

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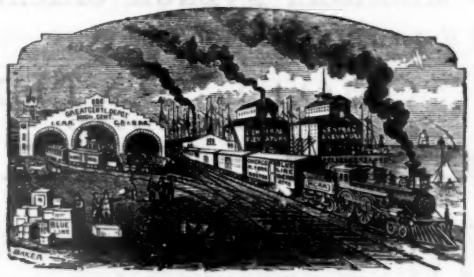
ORGANIZED JANUARY 1, 1867.

1870.  1870.

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THE "BLUE LINE" is the only route that offers to shippers of freight the advantages of an unbroken gauge through from Chicago to the Seaboard, and to all Interior Points on the line of Eastern Connections beyond Suspension Bridge and Buffalo. All Through Freight is then transported between the most distant points of the roads in interest,

WITHOUT CHANGE OF CARS!

The immense freight equipment of all the roads in interest is employed, as occasion requires, for the through service of this Line, and has of late been largely increased. This Line is now prepared to extend facilities for the transit and delivery of all kinds of freight in Quicker Time and in Better Order than ever before.

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are all of a solid, uniform build, thus largely lessening the chances of delay from the use of cars of a mixed construction, and the consequent difficulty of repairs, while remote from their own roads. The Blue Line is operated by the railroad companies who own it, without the intervention of intermediate parties between the Roads or Line and the public.

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ARE PREPARED TO TAKE FREIGHT FOR

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And All Points in the Central and Southern parts of the State;

MOBILE & NEW ORLEANS BY RAIL OR RIVER

And ALL POINTS on the MISSISSIPPI below CAIRO. Also, to

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☞ Freight Forwarded with Promptness and Despatch, and Rates at all times as LOW as by any other Route.

BY THE COMPLETION OF THE BRIDGE AT DUNLEITH,

THEY ARE ENABLED TO TAKE FREIGHT TO ALL POINTS WEST OF DUBUQUE ☞ WITHOUT CHANGE OF CARS! ☜

DELIVER FREIGHT IN CHICAGO ONLY at the FREIGHT DEPOT of the Company, foot of South Water St. Parties ordering Goods from the East should have the packages marked:

"Via Illinois Central Railroad."

For THROUGH BILLS OF LADING, and further information, pply to the LOCAL FREIGHT AGENT at Chicago, or to the undersigned.

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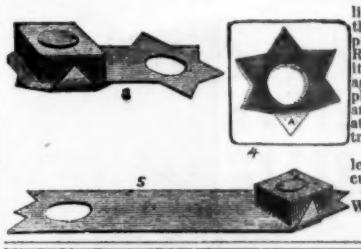
WALTER KATTE, ENGINEER. A. D. CHERRY, SECRETARY.

THE UNION PATENT STOP WASHER,



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It is especially adapted to, and extensively used by leading Railroads of the country for the purpose of securing nuts on railway joints.

The accompanying cuts show the application of the Washer. For further information, apply to

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The SAVING TO ROLLING STOCK AND MOTIVE POWER is at least equal to double the cost of the FROG. Orders should be addressed to

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AN ELEGANT PASSENGER STEAMER

Leaves Peoria every morning for St. Louis, upon arrival of Night Express, leaving Chicago daily (Saturday excepted) at **11 00 P. M.,** from Great Rock Island Depot, head of LaSalle St., arriving in St. Louis the following morning, connecting with morning trains leaving the city, and with steamers down the River.

Families Emigrating to Missouri or Kansas, will find this the most desirable and cheapest Route, as through Freight Rates for household goods are much lower than all rail routes.

☞ Connections at LA SALLE, with Illinois Central Railroad, North and South; at PEORIA, with Peoria, Pekin & Jacksonville Railroad, for Pekin, Virginia, &c.; at PORT BYRON JUNCTION, for Hampton, LeClaire, and Port Byron; at ROCK ISLAND, with Packets North and South on the Mississippi River.

☞ **For Through Tickets,** and all desired information in regard to Rates, Routes, etc., call at the Company's Office, No. **37** South Clark Street Chicago.

A. M. SMITH, Gen. Pass. Agent. HUGH RIDDLE, Gen. Supt. P. A. HALL, Asst. Gen. Supt.

R. T. CRANE, President. C. S. CRANE, Vice-President. S. W. ADAMS, Secretary.

THE NORTHWESTERN MANUFACTURING COMPANY,

SUCCESSORS TO R. T. CRANE & BRO.

MANUFACTURERS OF FIRST-CLASS

Steam Engines

[HORIZONTAL AND UPRIGHT,]

With Tremain's Patent Balance Valve,

Brass and Iron Goods for Steam and Gas Fitters and Engine Builders, Malleable Iron Castings, &c.

STEAM PUMPS, AND GENERAL MACHINERY,

WROUGHT IRON PIPE,

CONSTRUCTORS OF R. T. CRANE'S

PATENT STEAM WARMING & VENTILATING APPARATUS,

Perfected, Simplified and adapted to Dwellings, School-houses, Churches, &c., &c.

Jefferson St, between Lake and Randolph, Chicago

OFFICE: 100 WASHINGTON ST.

PITTSBURGH CAST STEEL SPRING WORKS.

A. French & Co.,

Manufacturers of Extra Tempered, Light Elliptic

CAST STEEL SPRINGS,

FOR RAILROAD CARS AND LOCOMOTIVES,

FROM BEST CAST STEEL.

OFFICE AND WORKS:—Cor. Liberty and 21st Sts., PITTSBURGH, PA.

CHICAGO BRANCH, 88 Michigan Ave.

HUSSEY, WELLS & CO.,

MANUFACTURERS OF ALL DESCRIPTIONS OF

CAST STEEL!

BEST REFINED STEEL FOR EDGE TOOLS.

Particular attention paid to the Manufacture of

Steel for Railroad Supplies.

HOMOGENEOUS PLATES,

For Locomotive Boilers and Fire Boxes.

Smoke Stack Steel, Cast Steel Forgings,

FOR CRANK PINS, CAR AXLES, &C.

Also Manufacturers of the Celebrated Brand,

"Hussey, Wells & Co. Cast Spring Steel,"

☞ **For Elliptic Springs for Railway Cars and Locomotives.**

Office and Works, Pittsburgh, Pa.

BRANCH WAREHOUSES:

88 MICHIGAN AVENUE, CHICAGO.

139 & 141 Federal St. Boston. | 30 Gold St., - - - New York.

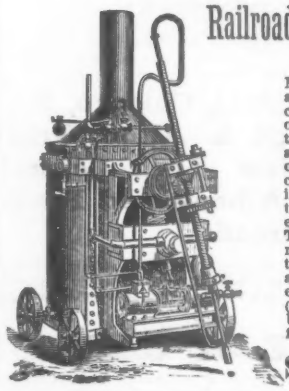
LESCHOT'S PATENT

DIAMOND POINTED

Steam Drills!

— FOR —

Railroad Grading, Well Boring, Prospecting, &c.



The unequalled efficiency and economy of these DRILLING MACHINES are fully established, and they are fast superseding all other inventions for **ROCK DRILLING.** They are constructed of various sizes and patterns to suit different classes of work, being adapted to Channelling and Gadding in quarries; to sinking, tunneling, prospecting and all open cut work in mines; also to heavy Railroad-grading and Sub-marine Blasting. They operate noiselessly without percussion; and produce a perfectly cylindrical hole of uniform diameter. Their usual rate of boring is three to five (3 to 5) inches per minute in hard rock; eight to ten (8 to 10) inches per minute in slate and sand rock, and eighteen to twenty-two (18 to 22) inches per minute in coal. TEST CORES, in the form of solid cylinders of rock or mineral may be taken out of mines from any depth—not exceeding one thousand (1,000) feet—showing the geological formation, character of mineral deposits, &c. These drills never need sharpening and no steel is consumed in boring—as the cutting points (*composed of rough, uncut diamonds,*) are practically indestructible. Boilers, Engines, Steam Pumps, and all necessary tools furnished with drills. Illustrated circular sent on application.

SEVERANCE & HOLT, Man'f's,

Office, 16 Wall Street, NEW YORK.

FILES LANCASTER FILE CO. **FILES**

MANUFACTURERS OF

Superior Cast Steel Files.

LANCASTER, PA.

The National Iron Co.

[*Successor to Wm. Hancock, Rough and Ready Iron Works,*]

ESTABLISHED 1847.

DANVILLE, PENNSYLVANIA.

MANUFACTURER OF

RAILROAD IRON,

RAILROAD CHAIRS, SPLICE BARS AND BOLTS, FROGS, SWITCH RODS, STANDS AND LEVERS, HOOKHEAD AND COUNTERSUNK HEAD SPIKES, BRIDGE AND CAR BOLTS, ROLLS AND ROLLING MILL MACHINERY, BLAST FURNACE CASTINGS AND MACHINERY, STEAM ENGINES AND BOILERS, IRON AND BRASS CASTINGS, ENGINE AND MACHINE WORK, STEAM & WATER FITTINGS, &c., &c.

WM. HANCOCK, President.

BENJ. J. WELCH, Sec., Treas. and Gen. Manager, Danville, Pa. | P. C. BRINCK, Vice-President, 40 Walnut St., Philadelphia.

CHICAGO & NORTHWESTERN R. W.

Comprising the PRINCIPAL RAILROADS from CHICAGO Directly NORTH NORTH-WEST and WEST.

ALL RAIL TO THE PACIFIC OCEAN!

Great California Line.

TRAINS LEAVE WELLS STREET DEPOT AS FOLLOWS:

8:15 A. M. Cedar Rapids Pass | **11:00 P. M. Night Mail.**
10:45 A. M. Pacific Express. | **11:00 P. M. R. Island Pass.**
10:45 A. M. Rock Island Exp. | **4:00 P. M. Dixon Passenger.**

For Fulton, Clinton, Cedar Rapids, Boone, Denison, Missouri Valley Junction, Sioux City, Council Bluffs and Omaha, there connecting with the

UNION PACIFIC R. R.

For Cheyenne, Denver, Ogden, Salt Lake, the White Pine Silver Mines, Sacramento, San Francisco, and all parts of Nebraska, Colorado, New Mexico, Arizona, Wyoming, Montana, Idaho, Utah, Nevada, and the PACIFIC COAST.

FROM CHICAGO	Hours.	1st Class Fare.	FROM CHICAGO	Days.	1st Class Fare.
To OMAHA,.....	23	$20.00	To SACRAMENTO,.	4½	$118.00
" DENVER,.....	52	70.75	" SAN FRANCISCO,	5	118.00

TRAINS ARRIVE:—Night Mail, **7.00** a. m.; Dixon Passenger, **11.10** a. m.; Pacific Express, **3:25** p. m.; Rock Island Express, **3:25** p. m.; Cedar Rapids Passenger, **6:50** p. m.

FREEPORT LINE.

9.00 A. M. & 9.45 P. M. For Belvidere, Rockford, Freeport, Galena, Dunleith, and St. Paul.

4.00 P. M., Rockford Accommodation.
5.30 P. M., Geneva and Elgin Accommodation
6.10 P. M., Lombard Accommodation.

TRAINS ARRIVE:—Freeport Passenger, **2:30** a. m., **3:00** p. m.; Rockford Accommodati **11:05** a. m.; Geneva and Elgin Accommodation, **8:45** a. m.; Lombard Accommodation, **6:50** a. m.

WISCONSIN DIVISION.

☞ Trains leave Depot, cor. West Water and Kinzie Sts., daily, Sundays excepted, as follows:

10.00 A. M. **DAY EXPRESS,** for Janesville, Monroe, Whitewater, Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER; Ripon, Berlin, Fond du Lac, Oshkosh, Neenah, Appleton, and Green Bay.

3.00 P. M., Janesville Accommodation.

5.00 P. M. **NIGHT EXPRESS,** for Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER; Ripon, Berlin, Fond du Lac, Oshkosh, Menasha, Appleton, Green Bay, and THE LAKE SUPERIOR COUNTRY.

5.30 P. M., Woodstock Accommodation.

TRAINS ARRIVE:—5:30 a. m., **9:00** a. m., **2:00** p. m. and **7:15** p. m.

MILWAUKEE DIVISION.

9.45 A. M. & 5.00 P. M. **EXPRESS,** (except Sunday,) for Waukegan, Kenosha, Racine and Milwaukee.

MILWAUKEE ACCOMMODATION, with Sleeping Car attached.....**11:00 P. M.**
EVANSTON ACCOMMODATION, (Daily,) from Wisconsin Div. Depot..... **1:30 P. M.**
KENOSHA ACCOMMODATION, (Sundays excepted) from Wells St. Depot..... **4:15 P. M.**
AFTERNOON PASSENGER, from Milwaukee Div. Depot..... **5:00 P. M.**
WAUKEGAN ACCOMMODATION, (except Sundays) from Wells St. Depot..... **5:25 P. M.**
WAUKEGAN PASSENGER, (Sundays excepted) from Wells St. Depot..... **6:10 P. M.**

TRAINS ARRIVE:—Night Accommodation, with Sleeping Car, **5:45** a. m.; Day Express, **10:45** a. m. and **7:30** p. m.; Waukegan Accommodation, **8:40** a. m.; Kenosha Accommodation, **9:10** a. m.; Evanston Accommodation, **4:00** p. m.; Waukegan Passenger, **8:10** a. m.

PULLMAN PALACE CARS ON ALL NIGHT TRAINS.

THROUGH TICKETS Can be purchased at all principal Railroad Offices East and South, and in Chicago at the Southeast corner of Lake and Clark Streets, and at the Passenger Stations as above.

H. P. STANWOOD, Gen. Ticket Agt. **JNO. P. HORTON,** N. W. Pass. Agt. **GEO. L. DUNLAP,** Gen'l Supt.

Western Union Railroad.

CHICAGO & NORTHWESTERN DEPOT, CHICAGO. | MILWAUKEE & CHICAGO DEPOT, MILWAUKEE.

THE DIRECT ROUTE!

CHICAGO, RACINE & MILWAUKEE,

— TO —

Beloit, Savanna, Clinton, Pt. Byron, Davenport, Mineral Point, Madison, Freeport, Fulton, Lyons, Rock Island, Sabula, Galena, Dubuque, Des Moines, Council Bluffs,

OMAHA, SAN FRANCISCO

AND ALL PRINCIPAL POINTS IN

Southern and Central Wisconsin, Northern Illinois, and Central and Northern Iowa.

FRED. WILD, Gen. Ticket Agent. **D. A. OLIN,** Gen Superintendent

CRERAR, ADAMS & CO.

MANUFACTURERS AND DEALERS IN

Railroad Supplies!

—AND—

CONTRACTORS' MATERIAL.

11 and 13 Wells Street,

CHICAGO, ILL.

Manufacturers of IMPROVED HEAD-LIGHTS for Locomotives, Hand and Signal Lanterns, Car and Station Lamps, Brass Dome Casings, Dome Mouldings, Cylinder Heads, and Car Trimmings, of Every Description

Pan-Handle

—AND—

Penn'a Central Route East!

☞ SHORTEST AND QUICKEST ROUTE, VIA COLUMBUS, TO ☜

PITTSBURGH, BALTIMORE, PHILADELPHIA & NEW YORK

On and after Saturday, JANUARY 1st, 1870, Trains for the East will run as follows:

[DEPOT CORNER CANAL AND KINZIE STS., WEST SIDE.]

6:45 A. M. NEW YORK EXPRESS. [SUNDAYS EXCEPTED.] Arriving at

COLUMBUS ....8:55 P. M.	HARRISBURG...2.30 P. M.	NEW YORK....10:26 P. M.	WASHINGTON
PITTSBURGH....4:47 A. M.	PHILADELPHIA 7:00 P. M.	BALTIMORE.. .. 7:00 P. M.	CITY.....10:00 P. M.

7:45 P. M. NIGHT EXPRESS. [SATURDAYS EXCEPTED.] Arriving at:

COLUMBUS.. .11:10 A. M.	HARRISBURG., 5:30 A. M	NEW YORK....12:05 P. M.	WASHINGTON. 1:00 P. M
PITTSBURGH.. 7:05 P. M.	PHILADELPHIA,9.40 A. M.	BALTIMORE... 9:00 A. M.	BOSTON.....11:50 P. M

Woodruff's Palace Day and Sleeping Cars

Run Through to COLUMBUS, and from Columbus to NEW YORK, WITHOUT CHANGE!

ONLY ONE CHANGE TO NEW YORK, PHILADELPHIA, OR BALTIMORE!

TRY THE NEW ROUTE. FARE AS LOW AS BY OTHER LINES.

CINCINNATI & LOUISVILLE AIR LINE SOUTH

Miles the Shortest Route to Cincinnati,
18 Miles the Shortest Route to Indianapolis and Louisville

—FROM ONE TO—

2 Hours the Quickest Route to Cincinnati

THE SHORTEST AND BEST ROUTE TO

Columbus, Chillicothe, Hamilton, Wheeling, Parkersburg, Evansville, Dayton, Zanesville, Marietta, Lexington, Terre Haute, Nashville,

ALL POINTS IN CENTRAL & SOUTHERN OHIO, & INDIANA, KENTUCKY & VIRGINIA.

— QUICK, DIRECT AND ONLY ALL RAIL ROUTE TO —

New Orleans, Memphis, Mobile, Vicksburg, Charleston, Savannah,

AND ALL POINTS SOUTH.

Cincinnati, Indianapolis and Louisville Trains run as follows:

THROUGH WITHOUT CHANGE OF CARS!

6:45 A. M. (Sundays excepted) Arriving at		**7:45 P. M.** (Saturdays excepted.) Arriving at	
LOGANSPORT	12:10 P. M.	LOGANSPORT	1:30 A. M.
KOKOMO	1:40 P. M.	KOKOMO	3:40 A. M.
CINCINNATI	9:40 P. M.	CINCINNATI	10:00 A. M.
INDIANAPOLIS	4:30 P. M.	INDIANAPOLIS	6:00 A. M.
LOUISVILLE	11:30 A. M.	LOUISVILLE	3:30 P. M.

Lansing Accommodation: Leaves 3:45 P. M. Arrives 9:15 A. M.

PULLMAN'S PALACE SLEEPING CARS!

Accompany all Night Trains between Chicago and Cincinnati or Indianapolis.

☞ Ask for Tickets via **COLUMBUS** for the East, via **HAGERSTOWN** for Cincinnati, and via **KOKOMO** for Indianapolis, Louisville and points South. Tickets for sale and Sleeping Car Berths secured at 95 **RANDOLPH STREET, CHICAGO,** and at Principal Ticket Offices in the West and Northwest.

WM. L. O'BRIEN, Gen. Pass. and Ticket Agent, Columbus. **I. S. HODSDON,** Northwestern Pass. Agt., Chicago.

KANSAS PACIFIC RAILWAY.

Great Smoky Hill Route!

— TO —

COLORADO, NEW MEXICO, ARIZONA, UTAH,

Montana, Nevada, California and Northern States of Old Mexico.

COMPLETED THROUGH KANSAS, TO

Carson, Colorado, 487 Miles West of Kansas City and Leavenworth.

Close Connections are made with Express Trains of the HANNIBAL & ST. JOSEPH and NORTH MISSOURI RAILROADS, at KANSAS CITY, and with MISSOURI PACIFIC RAILROAD at STATE LINE.

DAILY EXPRESS TRAINS are run between

KANSAS CITY, LEAVENWORTH, LAWRENCE,

Topeka, Wamego, Manhattan, Junction City, Salina, Brookville,

HARKER, HAYS and CARSON.

Pullman's Sleeping Cars Attached to Night Express Trains!

Passenger Time from Kansas City to Denver, Less than 50 Hours.

Hughes & Co.'s Four-Horse Concord Coaches leave Carson daily for Denver, Central City, Georgetown, &c.

Southern Overland Passenger Express and Mail Coaches leave Carson daily for Fort Lyon, Pueblo, Trinidad, Fort Union, Las Vegas, Santa Fe, &c.

Ask for Through Tickets via Kansas Pacific Railway, "Smoky Hill Route." Freight and Passage Rates as Low and Time as Quick as by any other Route.

R. B. GEMMELL, Gen. Ticket Agent. **A. ANDERSON,** Gen. Supt.

THE FAVORITE THROUGH PASSENGER ROUTE!

Chicago, Burlington & Quincy

RAILROAD AND CONNECTIONS.

3 THROUGH EXPRESS TRAINS DAILY.

FROM CHICAGO	Hours.	1st Class Fare.	FROM CHICAGO	Days.	1st Class Fare.
To OMAHA, - -	23	$20.00	To DENVER, - -	2¼	$70.75
" ST. JOSEPH, -	21	19.50	" SACRAMENTO.	4½	118.00
" KANSAS CITY, -	22	20.00	" SAN FRANCISCO,	5	118.00

TRAINS LEAVE CHICAGO from the Great Central Depot, foot of Lake Street, as follows:

BURLINGTON, KEOKUK, COUNCIL BLUFFS AND OMAHA,

7:40 A. M. **MAIL AND EXPRESS,** (Daily except Sunday,) stopping at all stations between Chicago and Burlington; making close connections at Mendota with Illinois Central for Amboy, Dixon, Freeport, Galena, Dunleith, Dubuque, LaSalle, El Paso, Bloomington, &c., &c.

10:45 A. M. **PACIFIC EXPRESS,** (Daily except Sunday,) stopping only at Riverside, Hinsdale, Aurora, Leland, Mendota, Princeton, Rock Island Crossing, Buda, Kewanee, Galva, Galesburg, and Monmouth, between Chicago and Burlington. **PULLMAN PALACE DRAWING ROOM CAR** attached to this train daily from Chicago

TO COUNCIL BLUFFS AND OMAHA, WITHOUT CHANGE!

11:30 P. M. **NIGHT EXPRESS,** (Daily, except Saturday,) stopping at all principal stations between Chicago and Burlington. ELEGANT DAY COACHES, and a **PULLMAN PALACE SLEEPING CAR** are attached to this train from **Chicago to Burlington, without change!** This is the only Route between

CHICAGO, COUNCIL BLUFFS & OMAHA,

— RUNNING THE CELEBRATED —

Pullman Palace Dining Cars!

The Shortest, Best, Quickest and only Route between

CHICAGO & KEOKUK,

Without Ferrying the Mississippi River!

QUINCY, ST. JOSEPH, LEAVENWORTH AND KANSAS CITY.

10:45 A. M. **PACIFIC EXPRESS,** (Daily, except Sunday,) with PALACE COACH attached, running through from Chicago to KANSAS CITY, **Without Change!**

5:00 P. M. **EVENING EXPRESS,** (Daily, except Sunday,) with **Pullman Palace Drawing Room Sleeping Car** attached, running through from Chicago to QUINCY, WITHOUT CHANGE!

11:30 P. M. **NIGHT EXPRESS** (Daily, except Saturday,) with **Pullman Palace Sleeping Car** attached from Chicago to GALESBURG; PALACE DAY COACHES from Chicago to QUINCY, **Without Change!**

☞ This is the Shortest, Quickest and only Route between ☜

CHICAGO AND KANSAS CITY,

WITHOUT CHANGE OF CARS OR FERRY.

THE SHORTEST, BEST AND QUICKEST ROUTE BETWEEN CHICAGO AND

St. Joseph, Atchison, Weston, Leavenworth,

AND ALL POINTS ON THE KANSAS PACIFIC R'Y.

Local Trains Leave { RIVERSIDE & HINSDALE ACCOMMODATION, 7:00 A. M. 1:30 & 6:15 P. M.
MENDOTA PASSENGER ..... 4:15 P. M.
AURORA PASSENGER ..... 5:30 P. M.

Trains Arrive:—Mail and Express, 3:45 p. m; Atlantic Exp, 4:15 p. m, except Sunday; Night Exp, 9:40 a. m., except Monday; Mendota Passenger, 10:10 a. m.; Aurora Passenger, 8:15 a. m.; Quincy Passenger 7:30 P. M.; Riverside and Hinsdale Accommodation, 6:50 and 9 a. m and 5:30 p. m., except Sunday.

Ask for Tickets via Chicago, Burlington & Quincy Railroad, which can be obtained at all principal offices of connecting roads, and at Company's office in Great Central Depot, Chicago, at as low rates as by any other route.

ROB'T HARRIS, Gen'l Superintendent, CHICAGO.
SAM'L POWELL, Gen'l Ticket Agent, CHICAGO.
E. A. PARKER, Gen. West. Pass. Agt., CHICAGO.

☞ **PASSENGERS GOING WEST!** ☜

To Missouri, Kansas, Nebraska, Colorado or New Mexico, Should Buy Tickets via the Short Route

HANNIBAL & ST. JOSEPH R. R. LINE.

Three Express Trains from Quincy or Macon to St. Joseph,

—ALSO DIRECT—

To Kansas City

☞ WITHOUT CHANGE OF CARS! ☜

CONNECTIONS ARE CLOSE AND DIRECT FOR

ATCHISON, WESTON & LEAVENWORTH.

CONNECTIONS:

AT KANSAS CITY, with Kansas Pacific Railway, for Lawrence, Ottawa, Topeka, Fort Riley Junction City, Fort Hays, Sheridan, &c.
AT KANSAS CITY, with Kansas City, Fort Scott, and Galveston Railroad, for Fort Scott, Fort Gibson, Galveston, &c.
AT ST. JOSEPH, with St. Joseph & Council Bluffs Railroad, ALL RAIL from St. Joseph to

Nebraska City, Council Bluffs & Omaha.

AT OMAHA, with Nebraska Union Pacific Railroad, for Fort Kearney, Julesburg, Cheyenne, Laramie, Benton, &c.
AT COUNCIL BLUFFS, for Sioux City, all Rail.

☞ By this Line, passengers have choice of Overland Routes, either via Smoky Hill or Platte Route To Denver, Central City, Salt Lake, Sacramento, California and all points in the Mining Regions.

Daily Overland Coaches via Smoky Hill Route leave Sheridan, end of U. P. R. R., for Santa Fe and New Mexico

Through Tickets for Sale at all Ticket Offices.

P. B. GROAT, Gen. Ticket Agent. GEO. H. NETTLETON, Gen. Supt.
HENRY STARRING, Gen. Agent, Chicago.

Old, Reliable, Air-Line Route!

CHICAGO, ALTON & ST. LOUIS R. R.

SHORTEST, QUICKEST AND ONLY DIRECT ROAD TO

Bloomington, Springfield, Jacksonville, Alton,

— AND —

ST. LOUIS!

WITHOUT CHANGE OF CARS.

THE ONLY ROAD MAKING IMMEDIATE CONNECTIONS AT ST. LOUIS, WITH MORNING AND EVENING TRAINS

—FOR—

ATCHISON, LEAVENWORTH, KANSAS CITY,

Lawrence, Topeka, Memphis, New Orleans,

And All Points South and Southwest.

☞ TRAINS leave CHICAGO from the West-side Union Depot, near Madison Street Bridge. ☜

EXPRESS MAIL, [Except Sundays]	10:00 A. M.
LIGHTNING EXPRESS, [Except Saturdays and Sundays]	11:00 P. M.
NIGHT EXPRESS, [Except Saturdays]	7:05 P. M.
JOLIET ACCOMMODATION, [Except Sundays]	4:00 P. M.
JACKSONVILLE EXPRESS, [Daily]	7:10 P. M.

Trains arrive at Chicago at 8.10 P. M., 7.10 A. M. and 12:45 P. M. Joliet Accom., 9.45 A. M.

This is the ONLY LINE Between CHICAGO & ST. LOUIS RUNNING

Pullman's Palace Sleeping and Celebrated Dining Cars!

BAGGAGE CHECKED THROUGH.

Through Tickets can be had at the Company's office, No. 55 Dearborn street, Chicago, or at the Depot, corner of West Madison and Canal streets, and at all principal Ticket Offices in the United States and Canada. Rates of Fare and Freights as low as by any other Route.

A. NEWMAN, Gen. Pass. Agent. J. C. McMULLIN, Gen. Supt.

North Missouri R. R.

PASSENGERS FOR

KANSAS AND THE WEST,

ARE REMINDED THAT

THE NORTH MISSOURI R. R.

— IS —

11 MILES SHORTER than any other Route!

BETWEEN

St. Louis and Kansas City.

15 Miles Shorter between ST. LOUIS and LEAVENWORTH

— AND —

49 MILES SHORTER TO ST. JOSEPH!

THAN ANY OTHER LINE OUT OF ST. LOUIS.

☞ **Three Through Express Trains Daily!** ☜

Pullman's Celebrated Palace Sleeping Cars on all Night Trains!

☞ **FOR TICKETS,** apply at all Railroad Ticket Offices, and see that you get your Tickets via St. Louis and North Missouri Railroad.

C. N. PRATT, Gen. East'n Agt., 111 Dearborn st. CHICAGO.
J. M. DAVIES, General Passenger Agent, ST. LOUIS.
S. H. KNIGHT, General Superintendent, ST. LOUIS.

Pacific Railroad of Missouri.

THE MOST DIRECT AND RELIABLE ROUTE FROM ST. LOUIS THROUGH TO

KANSAS CITY, LEAVENWORTH & ATCHISON,

☞ WITHOUT CHANGE OF CARS! ☜

Close Connections at KANSAS CITY with Missouri Valley, Missouri River, Ft. Scott & Gulf, and Kansas Pacific R'ys, for Weston, St. Joseph, Junction City, Fort Scott, Lawrence, Topeka, Sheridan, Denver, Fort Union, Santa Fe, and

ALL POINTS WEST!

☞ At SEDALIA, WARRENSBURG and PLEASANT HILL, with Stage Lines for Warsaw, Quincy, Bolivar, Springfield, Clinton, Osceola, Lamar, Carthage, Granby, Neosho, Baxter Springs, Fort Gibson, Fort Smith, Van Buren, Fayetteville, Bentonville.

PALACE SLEEPING CARS on all NIGHT TRAINS.

Baggage Checked Through Free!

THROUGH TICKETS for sale at all the Principal Railroad Offices in the United States and Canadas. **Be Sure and Get your Tickets over the PACIFIC R. R. OF MISSOURI.**

W. B. HALE, Gen. Pass. and Ticket Agt.
THOS. McKISSOCK, General Superintendent

Hours the Quickest, and Sixty-One Miles the Shortest Line!

— FROM —

CHICAGO TO NEW YORK.

Pittsburgh, Ft. Wayne & Chicago and Pennsylvania Central

IS THE ONLY ROUTE RUNNING

THREE DAILY LINES OF THROUGH DAY AND SLEEPING CARS,

— FROM CHICAGO TO —

Harrisburg, Philadelphia and New York,

☞ WITHOUT CHANGE! ☜

WITH BUT ONE CHANGE TO

BALTIMORE, PROVIDENCE, NEW HAVEN,

HARTFORD, SPRINGFIELD, WORCESTER AND BOSTON!

☞ Trains Leave WEST SIDE UNION DEPOT, corner West Madison and Canal Streets, as follows:

LEAVE:	Mail	Day Express.	Pacific Exp.	Night Exp.	VALPARAISO ACCOMMODATION. Leaves CHICAGO daily, (except Sunday,) at 4.50 P. M.
CHICAGO	7.00 A. M.	11.00 A. M.	5.15 P. M.	9.00 P. M.	
PLYMOUTH	9.01 "	11 25 "	s. 8 50 "	2.00 A. M.	
FORT WAYNE	D 11 59 "	D. 1.55 P. M.	11.20 "	n. 6.00 "	
LIMA	3.25 P. M.	3.53 "	1.32 A. M.	8.20 "	
FOREST	3.53 "	4 49 "	2 40 "	9 40 "	
CRESTLINE	n. 5.50 A. M.	s. 6.30 "	4.25 "	D. 12.05 P. M.	
MANSFIELD	6 30 "	7 00 "	4.53 "	12.34 "	
ORRVILLE	9.05 "	8 52 "	6 43 "	2.27 "	
ALLIANCE	D 11 15 "	10 25 "	B. 8.40 "	3.55 "	
ROCHESTER	2 05 P. M.	12.35 A. M.	10.52 "	6.42 "	
PITTSBURGH	3 50 "	2.10 "	D. 12 35 "	s. 7.40 "	5.30 A. M.
BLAIRSVILLE BRANCH	6.05 "	4.20 "	2.49 P. M.	9.54 "	7.35 "
JOHNSTOWN	6.56 "	5.06 "	3.37 "	10.42 "	8.10 "
CRESSON	7.58 "	6.08 "	4.38 "	11.43 "	9.04 "
ALTOONA	s. 9.05 "	n. 7.15 "	s. 5.45 "	12.35 A. M.	n. 10.05 "
HUNTINGDON	10.21 "	8.26 "	7.04 "	1.45 "	11.14 "
LEWISTOWN	11.44 "	9.41 "	8.23 "	2.59 "	12.35 P. M.
HARRISBURG	2.10 A. M.	D 12.10 P. M.	10.45 "	5.20 "	D. 2.50 "
LANCASTER	3.40 "	1.35 "	12.15 A. M.	6.42 "	4.10 "
DOWNINGTON	5.00 "	2.55 "	1.40 "	n. 8.12 "	5.35 "
ARRIVE:					**South'n Exp.**
PHILADELPHIA	6.20 "	4.15 "	3.00 "	9.30 "	6.50 "
NEW YORK, VIA PHILADELPHIA	10.41 "	7.48 "	6.43 "	1.00 P. M.	10.26 "
NEW YORK, VIA ALLENTOWN	... .	6.35 "	.....	12.05 P. M.	.....
BALTIMORE	.....	3.40 "	2.20 "	9.00 A. M.	7.00 "
WASHINGTON	.....	6.20 "	5.50 "	1.00 P. M.	10.00 "
BOSTON	9.00 P. M.	5.50 A. M.	5.05 P. M.	11.50 "	.....

THE DAY EXPRESS Leaves Chicago daily, except Sunday; has SILVER PALACE CARS from Chicago to New York, via Allentown, except Saturday; leaves Pittsburgh daily, except Sunday; has SLEEPING CAR from Crestline to Altoona, except Saturday. This train **reaches NEW YORK one and a half hours in advance of all other Lines, and in time to make close connection for BOSTON!** No other Route through New York makes it! Arrives in BALTIMORE **Five Hours,** and WASHINGTON **Four Hours in Advance of Rival Routes!**

THE PACIFIC EXPRESS Leaves Chicago and Pittsburgh daily, for Philadelphia and New York, with THROUGH SILVER PALACE CARS from Chicago; leaves Harrisburg for Baltimore daily, except Sunday; has SLEEPING CARS from Chicago to Pittsburgh, and from Altoona to Philadelphia. This train arrives in NEW YORK **One Hour,** BALTIMORE **Nine Hours,** and WASHINGTON **Seven Hours, in Advance of all other Lines!**

THE NIGHT EXPRESS Leaves Chicago daily, except Saturday and Sunday; leaves Pittsburgh daily, except Sunday; leaves Harrisburg for Baltimore daily; has SILVER PALACE CARS on Tuesday, Wednesday and Friday; COMPARTMENT CAR on Monday and Thursday from Chicago to Philadelphia and New York; has SLEEPING CARS from Chicago to Crestline, and from Pittsburgh to New York, Philadelphia and Baltimore. This train reaches NEW YORK **One Hour,** and BALTIMORE **Three Hours in Advance of competing Routes!**

THE MAIL Leaves Chicago daily, except Sunday, stopping at all Stations, and reaching Crestline the same evening (where passengers can transfer to Day Express); leaves Crestline [Express,] the next morning, and leaves Pittsburgh daily, except Sunday. SLEEPING CARS from Pittsburgh to Philadelphia.

THE SOUTHERN EXPRESS Leaves PITTSBURGH daily, except Monday, with SILVER PALACE CARS to Philadelphia and New York; leaves Harrisburg for Baltimore daily, except Sunday.

BOSTON AND NEW ENGLAND PASSENGERS will find this Route especially Desirable, as it Gives them an opportunity of Seeing the FINEST VIEWS AMONG THE ALLEGHANY MOUNTAINS,

Besides Visiting PITTSBURGH, PHILADELPHIA and NEW YORK, without extra cost!

All New England Passengers holding Through Tickets, will be Transferred, with their Baggage, to Rail and Boat Connections in NEW YORK, WITHOUT CHARGE.

Close Connections Made at Lima for all Points on the Dayton & Mich. and Cin., Hamilton & Dayton R'ys,

And at CRESTLINE, for CLEVELAND, ERIE, DUNKIRK, BUFFALO, NIAGARA FALLS, and all Points reached via Lake Shore R.R.

THROUGH TICKETS FOR SALE AT THE COMPANY'S OFFICES, N.W. COR. RANDOLPH & LA SALLE ST.,

65 and 52 Clark St., Cor. Randolph and Wells St., (under the Briggs House,) and at Depot, Chicago; also at Principal Ticket Offices in the West.

F. R. MYERS, Gen. Pass. and Ticket Agt, P. & F. W. R'y, Chicago. W. C. CLELAND, Gen. Western Pass. Agt, P. Ft. W. & C. R'y, Chicago.
T. L. KIMBALL, Gen. Western Pass. Agent, Penn. Central R. R., Chicago.

NEW YORK AND BOSTON!

— VIA —

ALLENTOWN LINE.

☞ THE ONLY LINE ☜

Running Through Silver Palace Cars on Morning Trains from Chicago,

Via PITTS., FT. WAYNE & CHICAGO R'Y & ALLENTOWN LINE.

TWO EXPRESS TRAINS LEAVE CHICAGO VIA ALLENTOWN LINE,

On the Arrival of Trains from the West and South, as follows:

8:00 A. M. Sat. & Sun. Excepted. 9:00 P. M. Sat. & Sun. Excepted.

PASSENGERS SHOULD SEE THAT THEIR TICKETS ARE VIA ALLENTOWN, and SAVE 60 to 100 MILES TRAVEL!

THE SHORTEST LINE TO NEW YORK!

BAGGAGE CHECKED THROUGH!

FOR TICKETS and Information, apply at the Office, 52 Clark Street, under the Sherman House. SLEEPING CAR APARTMENTS and Time Tables furnished.

ROB'T EMMETT, Western Pass. Agent, 52 Clark St., CHICAGO.

H. P. BALDWIN, General Pass. Agent, 119 Liberty St., NEW YORK.

Broad Gauge! Double Track!

ERIE RAILWAY.

4 EXPRESS TRAINS DAILY!

From Cleveland, Dunkirk and Buffalo, 625 Miles, to New York, WITHOUT CHANGE of Coaches!

☞ The Trains of this Railway are run in DIRECT CONNECTION WITH ALL WESTERN AND SOUTHERN LINES, for

Elmira, Williamsport, Oswego, Great Bend, Scranton, Newburgh,

NEW YORK, ALBANY, BOSTON, PROVIDENCE,

AND PRINCIPAL NEW ENGLAND CITIES.

New and Improved DRAWING ROOM COACHES are attached to the DAY EXPRESS Running THROUGH TO NEW YORK.

☞ **SLEEPING COACHES,** Combining all Modern Improvements, with perfect Ventilation and the peculiar arrangements for the comfort of Passengers incident to the **BROAD GAUGE,** accompany all night trains to New York.

CONNECTIONS CERTAIN! as Trains on this Railway will, when necessary, **wait from one to two hours for Western trains.**

All Trains of Saturday run directly Through to New York.

☞ **Ask for Tickets via Erie Railway,** which can be procured at **66 Clark Street,** Chicago, and at all Principal Ticket offices in the West and Southwest.

L. D. RUCKER, Gen'l Superintendent, New York. | **A. J. DAY,** Western Passenger Agent, Chicago. | **WM. R. BARR,** Gen'l Passenger Agent, New York.

LAKE SHORE
— AND —
MICHIGAN SOUTHERN R.W.

THE GREAT THROUGH LINE BETWEEN

CHICAGO, BUFFALO & NEW YORK,

WITHOUT CHANGE!

AND THE ONLY RAILWAY

RUNNING PALACE COACHES THROUGH!

— BETWEEN —

CHICAGO & NEW YORK, via BUFFALO

☞ WITHOUT TRANSFER OF PASSENGERS! ☜

All Trains Stop at Twenty-Second Street to Take and Leave Passengers. Baggage Checked at that Station for all Points East.

4 EXPRESS TRAINS DAILY, [Sundays Excepted,] Leave Chicago from the New Depot, on Van Buren St., at the head of La Salle Street, as follows:

7:30 A. M. MAIL TRAIN. VIA OLD ROAD. SUNDAYS EXCEPTED.

Leaves 22d Street 7:45 A. M. Stops at all Stations. **Arrives**—Toledo, 6:30 P. M.

11:00 A. M. SPECIAL NEW YORK EXPRESS, VIA AIR LINE. SUNDAYS EXCEPTED.

Leaves—Twenty-Second Street, **11:15 A. M.** **Arrives**—Elkhart, 2:55 P. M.; Cleveland 10:30 P. M.; Buffalo, 4:10 A. M.; New York, 6:55 P. M.; Boston, 11:45 P. M.

This Train has PALACE SLEEPING COACH Attached, Running

THROUGH TO ROCHESTER, WITHOUT CHANGE!

IN DIRECT CONNECTION WITH

Wagner's Celebrated Drawing-Room Coaches on N. Y. Central R. R.

5:15 P. M. ATLANTIC EXPRESS (Daily), VIA AIR LINE.

Leave—Twenty-Second Street **5:30 P. M.** **Arrives**—Laporte, 8:10 P. M. (Stops 20 minutes for Supper); arrives at Toledo, 2:50 A. M.; Cleveland, 7:25 A. M. (30 minutes for Breakfast); arrives at Buffalo, 1:55 P. M.; Rochester, 5:10 P. M. (30 minutes for Supper); connects with **Sleeping Coach running Through from Rochester to Boston Without Change,** making but **One Change between Chicago and Boston.**

NEW AND ELEGANT SLEEPING COACH Attached to this Train, Running THROUGH from CHICAGO TO NEW YORK WITHOUT CHANGE! Arrives at NEW YORK, 7:00 A. M.

9:00 P. M. NIGHT EXPRESS VIA AIR LINE. (DAILY EXCEPT SAT. & SUN.)

Leaves—Twenty-Second Street, **9:15 P. M.** **Arrives**—Toledo, 6:35 A. M. (20 minutes for Breakfast); arrives at Cleveland, 10:35 A. M.; Buffalo, 5:30 P. M.; New York, 11:00 A. M.; Boston, 3:50 P. M.

KALAMAZOO DIVISION.

Leave Chicago 7:30 A. M. Arrive at Kalamazoo 3:15 P. M.; Grand Rapids, 8:15 P. M.

Leave Chicago 9:00 P. M. Arrive at Kalamazoo 4:40 A. M.; Grand Rapids, 10:00 A. M.

☞ There being no heavy grades to overcome, or mountains to cross, the road bed and track being the smoothest and most perfect of any railway in the United States, this Company run their trains at a high rate of speed with perfect safety.

☞ Travelers who wish to SAVE TIME and make SURE CONNECTIONS, purchase Tickets via

LAKE SHORE & MICHIGAN SOUTHERN R'Y.

THE ONLY LINE RUNNING THROUGH BETWEEN CHICAGO AND BUFFALO, WITHOUT TRANSFER, and in Direct Connection with NEW YORK CENTRAL RAILROAD and ERIE RAILWAY.

General Ticket Office for Chicago, No. 56 Clark Street.

CHAS. F. HATCH, General Superintendent, CLEVELAND, OHIO.

F. E. MORSE, General Western Passenger Agent, CHICAGO.

ILLINOIS CENTRAL RAILROAD.

PASSENGER TRAINS LEAVE CHICAGO FROM THE GREAT CENTRAL DEPOT, FOOT OF LAKE ST

ST. LOUIS AND CHICAGO THROUGH LINE.

8:30 A. M. DAY EXPRESS, Sundays Excepted. Arriving in ST. LOUIS at 9:30 P. M.

☞ This Train Reaches St. Louis ONE HOUR & FIFTEEN MINUTES in Advance of any other Route! ☜

9:30 P. M. FAST LINE. Saturdays Excepted. Arriving at ST. LOUIS at 10:30 A. M.

AT ST. LOUIS, Direct Connections are Made FOR

Jefferson City, Sedalia, Pleasant Hill, Macon, Kansas City,

LEAVENWORTH, ST. JOSEPH & ATCHISON,

—Connecting at KANSAS CITY for—

LAWRENCE, TOPEKA, JUNCTION CITY, SALINA, SHERIDAN, &c.

CAIRO, MEMPHIS AND NEW ORLEANS LINE.

8:30 A. M. CAIRO MAIL, Sundays Excepted. Arriving at **Cairo** 2:20 A. M., **Memphis** 12:40 P. M., **Mobile** 9:40 A. M., **Vicksburg** 9:30 A. M., **New Orleans** 11:10 A. M.

9:30 P. M. CAIRO EXPRESS, Except Saturdays. Arriving at **Cairo** 3:15 P. M., **Memphis** 2:30 A. M., **Vicksburg** 5:00 P. M., **New Orleans** 1:30 A. M.

4:50 P. M. CHAMPAIGN PASSENGER, Arriving at **Champaign** at 11:00 P. M.

☞ THIS IS THE ONLY DIRECT ROUTE TO

Humboldt, Corinth, Grand Junction, Little Rock, Selma, Canton, Grenada, Columbus, Meridian, Enterprise,

MEMPHIS, VICKSBURG, NEW ORLEANS & MOBILE.

At NEW ORLEANS, connections are made for

GALVESTON, INDIANOLA,

And all Parts of Texas.

☞ NOTICE.—This Route is from 100 to 150 MILES SHORTER, and from 12 to 24 HOURS QUICKER than any other.

THIS IS ALSO THE ONLY DIRECT ROUTE TO

DECATUR, TERRE HAUTE, VINCENNES & EVANSVILLE.

Peoria and Keokuk Line.

8:30 A. M. KEOKUK PASSENGER, Sun. Ex. Arriving at **Chenoa** 3:15 P. M., **El Paso** 4:05 P. M., **Peoria** 5:40 P. M., **Canton** 7:14 P. M., **Bushnell** 8:59 P. M., **Keokuk** 11:36 P. M., **Warsaw** 12:05 A. M.

9:30 P. M. KEOKUK PASSENGER, **On Saturdays, this Train will leave at 4:50 P. M.** Arriving at **Chenoa** 3:35 A. M., **El Paso** 4:25 A. M., **Peoria** 6:05 A. M., **Canton** 7:36 A. M., **Bushnell** 9:25 A. M., **Keokuk** 12:05 P. M., **Warsaw** 12:40 P. M.

THIS IS THE DIRECT ROUTE TO

PEORIA, CANTON, KEOKUK, CHATSWORTH, FAIRBURY,

CHENOA, EL PASO, BUSHNELL, HAMILTON, & WARSAW.

Connecting at PEORIA for

PEKIN, HAVANA, BATH AND VIRGINIA.

—CONNECTING AT KEOKUK FOR—

Ottumwa, Eddyville, Oskaloosa, Pella, Monroe, Des Moines.

Elegant Drawing Room Sleeping Cars

ATTACHED TO ALL NIGHT TRAINS.

☞ SPACIOUS AND FINE SALOON CARS, with all Modern Improvements, Run upon all Trains.

BAGGAGE CHECKED THROUGH TO ALL IMPORTANT POINTS.

☞ For Through Tickets, Sleeping Car Berths, Baggage Checks, and information, apply at the office of the Company in the Great Central Depot, foot of Lake St.

Hyde Park and Oakwoods Train.

	Leave.	Arrive.		Leave.	Arrive.
HYDE PARK TRAIN,...	*6:30 A. M.	*7.45 A. M.	HYDE PARK TRAIN,....	*3:00 P. M.	*3:15 P. M.
HYDE PARK TRAIN...	8:05 A. M.	9.18 A. M.	HYDE PARK TRAIN,....	*6:10 P. M.	*7:25 P. M.
HYDE PARK TRAIN,..	*12:10 P. M.	*1:40 P. M.			

* Sundays Excepted.

W. P. JOHNSON, Gen. Pass. Agent. **M. HUGHITT, Gen. Supt.**

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SPEED! COMFORT! SAFETY!

MICHIGAN CENTRAL and GREAT WESTERN RAILWAYS!

The Great Central Route, via Niagara Falls, to

NEW YORK AND NEW ENGLAND.

Pullman's Magnificent Palace Drawing-Room Cars,

— FROM —

CHICAGO TO NEW YORK CITY, WITHOUT CHANGE.

4 PASSENGER TRAINS LEAVE CHICAGO, DAILY EXCEPT SUNDAY.
(DEPOT, FOOT OF LAKE STREET,) as Follows:

5:00 A. M. MAIL TRAIN. Stops at all Stations.
(SUNDAYS EXCEPTED.) Arrives DETROIT at 5:50 P. M.

11:00 A. M. SPECIAL NEW YORK & BOSTON EXP.
(SUNDAYS EXCEPTED.) Arrives at Michigan City 1:12 P.M.; New Buffalo 1:32, Niles 2:13, [Dinner], Kalamazoo 3:44 P. M.; Battle Creek 4:24, Marshall 4:43, Jackson 5:40, Detroit 7:35, London 11:15, Hamilton 2:00 A. M.; Toronto 9.20, Suspension Bridge 3:40, Rochester 6:50 A. M.; Albany, 2:40 P. M.; NEW YORK, 7:00, BOSTON, 11:50 P. M. ☞ This train connects at ROCHESTER (7:00 A. M.) with

Wagner's Magnificent Palace Drawing-Room Cars!

☞ RUNNING THROUGH TO NEW YORK, WITHOUT CHANGE! ☜

5:15 P. M. ATLANTIC EXPRESS.
(DAILY.) Arrives at Michigan City, 7:18 P. M.; Niles 8:30 P. M. [Supper]; Kalamazoo, 10:25 P. M.; Jackson, 1:00 A. M.; Detroit 3:40, London, 8:35, [Breakfast]; Hamilton 11:50, Suspension Bridge 1:30 P. M.; Rochester 5:10 P. M.; Albany, 1:50 A. M.; NEW YORK, 7:00 A. M.; BOSTON, 11:00 A. M.
A MAGNIFICENT DRAWING-ROOM SLEEPING CAR is attached to this train daily, FROM CHICAGO TO NEW YORK CITY. The celebrated

☞ **Hotel Drawing-Room Car is also attached to this Train from Chicago to Rochester!** ☜

☞ These, together with **ELEGANT DAY CARS TO SUSPENSION BRIDGE,** make this Train the favorite Train for all points East.

SPECIAL NOTICE.—Boston and New England Passengers will please notice that this Train now makes direct connection through. A SLEEPING CAR is attached at Rochester at 5.30 P. M., running through to Springfield, Mass., thus avoiding transfer at Albany. Breakfast at Springfield. This Train reaches Springfield early enough second morning to **Connect with all Trains** up and down the Connecticut.

9:00 P. M. NIGHT EXPRESS.
(SAT. & SUN. EXCEPTED). Arrives at Michigan City, 11:03 P. M.; Niles, 12:25 A. M.; Kalamazoo, 2:00; Marshall, 3:12; Jackson, 4:25; Grand Trunk Junction, 7:00; Detroit, 7:30; London, 1:45 P. M.; Hamilton, 4:35; Toronto, 9:35; Niagara Falls, 6:15; Buffalo, 7:15 P. M.; Rochester, 9:10; Syracuse, 12:35 A. M.; Rome, 1:55; Utica, 2:25; Albany, 6:30 A. M.; NEW YORK, 10:00 A. M.; BOSTON, 3:40 P. M.

PULLMAN'S PALACE SLEEPING CARS ARE ATTACHED TO THIS TRAIN FROM CHICAGO TO DETROIT,
And from Suspension Bridge to New York.

WE INVITE THE ATTENTION OF THE TRAVELER to the SPLENDID EQUIPMENTS of this FIRST-CLASS LINE TO THE EAST!

☞ FOR THROUGH TICKETS, and any and all information, Sleeping Car accommodations, &c., apply at General Office in Tremont House Block, at office in Great Central Depot; also at No. 60 Clark street, under Sherman House; at Grand Trunk Railway Office, 48 Clark street, or at New York Central Railroad Office, No. 53 Clark street, and at office under Briggs House.

H. E. SARGENT, Gen. Supt. M. C. R. R. W. K. MUIR, Gen. Supt. Gt. Western R. W. HENRY C. WENTWORTH, Gen. Pass. Agt.

CHICAGO, INDIANAPOLIS & LOUISVILLE

THROUGH LINE!

—VIA—

VIA MICHIGAN CENTRAL RAILROAD.

THE ONLY ROUTE TO

TO LOUISVILLE, WITHOUT CHANGE OF CARS.

TWO EXPRESS TRAINS Leave Chicago Depot, Foot of Lake as Follows:

8:00 A. M. MORNING EXPRESS.
(EXCEPT SUNDAY.) Arriving at LaFayette, 2:25 P. M.; Indianapolis, 6:00 P. M; Louisville, 11:30 P. M.

4:00 P. M. AFTERNOON EXPRESS.
(EXCEPT SATURDAY.) Arriving at Michigan City 6:20 P. M. [Supper]; LaFayette, 11:30 P. M. Indianapolis, 2:15 A. M.; Louisville, 7:00 A. M.; Nashville, 4 00 P. M.

A GOOD SLEEPING CAR is Attached to this Train Every Night,
And goes from Chicago to Louisville WITHOUT CHANGE!

☞ **SPECIAL NOTICE.**—This Train stops at Michigan City for Supper, and waits at that point for Michigan Central Atlantic Express East, leaving Chicago at 4:45 p. m. Passengers going South, and wishing as much time in Chicago as possible, can take the 4:45 p. m. Michigan Central Atlantic Express, and connect without fail at Michigan City, with above Through Louisville Express.

☞ **THE GREAT BRIDGE ACROSS THE OHIO** at Louisville being completed, passengers are relieved of the omnibus transfer.

FOR THROUGH TICKETS, via this line, apply at offices of connecting lines and at all ticket offices in Chicago.

HENRY C. WENTWORTH, Gen. Pass. Agent.

Michigan Central R. R.

LOCAL CONNECTIONS:

Chicago & Michigan Lake Shore Railroad.

Open from New Buffalo to St. Joseph, Mich.

8:00 A. M. AND **4:00** P. M. Trains from Chicago Connect at New Buffalo.

Kalamazoo, Allegan & Grand Rapids R. R.

Open to Grand Rapids.

8:00 A. M. AND **9:00** P. M. Trains from Chicago Connect at Kalamazoo.

Peninsular Railroad of Michigan.

Open to Charlotte.

8:00 A. M. AND **9:00** P. M. Trains from Chicago Connect at Battle Creek.

Jackson, Lansing & Saginaw Railroad.

Open to Bay City, Mich. Passing through Lansing and Saginaw.

8:00 A. M. AND **9:00** P. M. Trains from Chicago Connect at Jackson.

GRAND TRUNK RAILWAY.

All Michigan Central Trains Connect at Grand Trunk Junction

— FOR —

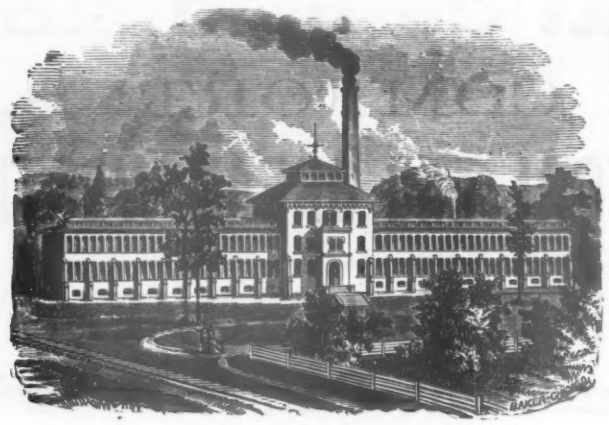
SARNIA, TORONTO, MONTREAL,

PORTLAND, BOSTON, BUFFALO, OGDENSBURG

AND ALL POINTS EAST.

H. E. SARGENT, General Superintendent.

Elgin Watches!



Elgin Watches!

MANUFACTURED BY

THE NATIONAL WATCH COMP'Y.

OFFICE GEN'L SUP'T U. P. R. R. } OMAHA, Neb., Dec. 16, 1869. }

HON. T. M. AVERY, President National Watch Co., Chicago, Ill.

Dear Sir—During the months that I have carried one of your B. W. Raymond Watches, it has not failed to keep the time with so much accuracy as to leave nothing to desire in this regard.

For accuracy in time keeping, beauty of movement and finish, your watches challenge my admiration and arouse my pride as an American, and I am confident that in all respects they will compete successfully in the markets of the world with similar manufactures of older nations. They need only to be known to be appreciated.

Yours, most respectfully,
C. G. HAMMOND, Gen. Supt.

OFFICE OF GEN'L SUP'T H. R. R. R. } NEW YORK, Jan. 17, 1870. }

M. AVERY, ESQ., President National Watch Co..

Dear Sir—The Watch made by your Company, which I have carried the past two months, has kept excellent time. I have carried it frequently on engines, and have been on the road with it almost daily. During this time it has run uniformly with our standard clock. Truly yours,
J. M. TOUCEY.

PENN'A R. R. CO., GEN. SUP'T. OFFICE, } ALTOONA, Jan. 19, 1870. }

T. M. AVERY, Esq., President National Watch Co., Chicago:

Dear Sir—This Company has purchased and put in the hands of its engine-men, eighty "Raymond movements," which have given excellent satisfaction and proved to be very reliable time-keepers. In addition to these, quite a number of Elgin Watches have been purchased by officers and employes of this Company, all of whom have been well pleased with the efficiency and regularity of the movements manufactured by the National Watch Company. Respectfully,
EDWARD H. WILLIAMS,
General Superintendent.

AMERICAN MERCHANTS' UNION EXPRESS CO. } CHICAGO, Feb. 17, 1870. }

T. M. AVERY, Esq., President National Watch Co., Chicago, Ill.:

Dear Sir—It gives me pleasure to state that the two or three Elgin Watches I have at different times purchased for presentation have given entire satisfaction, and are highly valued as elegant and correct time-keepers.

A very large number of your Watches are being carried by the Messengers in the employ of this Company, and are giving entire satisfaction, their time-keeping qualities being implicitly relied upon.
CHAS. FARGO.

MICHIGAN CENTRAL R. R CO. } CHICAGO, Jan. 15, 1870. }

T. M. AVERY, Esq., President National Watch Co.:

Dear Sir—I have now been carrying one of your Elgin Watches, of the B. W. Raymond pattern, for nearly five months, and it affords me much pleasure to testify in favor of its time-keeping qualities, in which, after this length of time, I have great confidence. It has from the first run very close to the standard time, the slight variation being uniform, and susceptible of correction by careful regulation. My experience thus far justifies the opinion that it is a *very safe and reliable* time-keeper.

Respectfully yours, H. E. SARGENT.

OFFICE OF THE GEN. SUP'T, C. & N. W. R'Y, } CHICAGO, Feb. 16, 1870. }

T. M. AVERY, Esq., President National Watch Co.:

Dear Sir—I have pleasure in expressing my opinion of the Elgin Watches, the more so since I do not think there is a better watch made. A large number of them are in use by our conductors and enginemen, and other employes, and I have heard no dissenting opinion upon their merits. They run with a smoothness and uniformity fully equal to any other watch I know of, and justify all your claims of excellence in manufacture and fitting of parts. Yours, truly,
GEO. L. DUNLAP, Gen'l Sup't.

LAKE SHORE & MICHIGAN SOUTHERN R. R. } CHICAGO, Jan. 27, 1870. }

T. M. AVERY, Esq., President National Watch Co.:

Dear Sir—I have carried the Elgin Watch long enough to be able to pronounce it a first-rate time-keeper. I am making a very careful test of its performance and will soon give you the results. I think it will show that the West can produce Watches equal to to the manufacture of any part of the world. Yours, truly,
E. B. PHILLIPS,
President L. S. & M. S. R. R. Co.

OFFICE GEN. SUP'T ERIE RAILWAY, } NEW YORK, Feb. 7, 1870. }

T. M. AVERY, Esq., President National Watch Co., Chicago, Ill.:

Dear Sir—Having for about three months tested, in various ways, the "time-keeping" qualities of one of your Elgin Watches, I most cheerfully award it the praise that it is due. For one month the Watch was carried by one of our Locomotive Engineers, and since by different persons, so that its full value as a time-keeper could be known under different modes of treatment. I will simply say that it has given *perfect* satisfaction, and in my opinion is as near perfection as I believe it possible a Watch can be made.
Respectfully yours, L. H. RUCKER,
General Superintendent.

☞ No Movements Retailed by the Company. } Business Office and Salesroom of the National Watch Company, Nos. 159 and 161 Lake Street, Chicago.

"THE RAILROAD TICKET PRINTING HOUSE."

Rand, McNally & Co.,
[TRIBUNE JOB OFFICE,]
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—AND—
Blank Book Manufacturers
IN THE WEST.
Railroad Printing and Stationery a Specialty.
Consecutively Numbered Railroad Tickets,
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DATING PRESSES, CANCELING STAMPS,
ETC., ETC., ETC.
49, 51 and 53 Clark Street,
CHICAGO.

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Harrisburg, Pennsylvania,
MANUFACTURE
Passenger, Mail,
Baggage, Box,
Gondola, Coal,
AND ALL OTHER KINDS OF
RAILROAD CARS!
Railroad Car Wheels & Castings,
Bridge & Rolling Mill Castings,
Bridge Rods, Bolts,
—AND—
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W. T. HILDRUP, *Superintendent.*
WILLIAM COLDER, *President.*

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